
Metabolism in Architecture

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Preface

This book is a collection of my most important works – in architecture and theoretical writing – from the period 1960 to 1975. I have chosen the title *Metabolism in Architecture* despite the fact that the Metabolist group, formed in 1960, now carries on virtually no activity as a group, and despite the many changes in my work and thought in the fifteen years since the Metabolist movement began. The word ‘metabolism’ nevertheless stands in order to secure a wider understanding of the concept and because there is value in using it in this extended sense. I was also led to select this title out of a desire to reflect upon and organize the relation between my writings and works of these fifteen years and Metabolist thought.

For the convenience of the reader the book is organized into four chapters. The architecture and writings are not in chronological order, although the date at which each work was designed or written is important to me. As we live in an international society with rapid communication in which we are constantly open to new influences the date for each piece indicates the spirit in which it was written.

Although I reject traditionalism, I attach great importance to the influence which the culture of one country may exert on another. It is my belief that the cultures of different countries will stand individually but together, allied with technology, to provide the future language of architecture. That modern architecture appears diffuse is proof that the cultures of different regions each contribute to the language of modern architecture, and as a result modern architecture will probably come to speak not with a *lingua franca* but with a complex and many-faceted language.

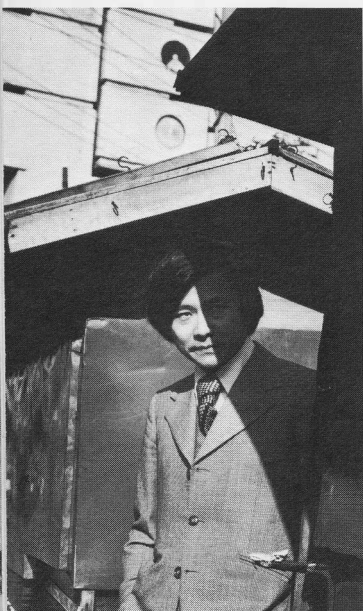
Kisho Kurokawa

Introduction

by Charles Jencks

(1) These photos show Kurokawa outside his Nakagin Capsule Building and at the moss garden in Kyoto. The round hole motif is common to both his buildings and traditional architecture, a point he indicates here half jokingly: 'Who me? ... I copied this?'

At first glance Kisho Kurokawa seems more like a statistic dreamed up by the Japanese Board of Trade than a living person. Press reports invariably start with a roll-call of triumphs achieved at the age of forty: thirty-five major buildings designed and built, seventeen books written, four new towns of his design under construction, head of an architect's firm with one hundred employees and an urban design office of forty. And then there are the odder numbers: Kurokawa heads a think tank of thirty (called ominously the Institute for Social Engineering), he appears monthly before a TV audience of thirty million, he works eighteen hours in twenty-four (which means 'he sleeps an hour longer than Napoleon') and, unlikely category, he is Japan's third most popular person (this was before Tanaka's resignation; perhaps he has moved up to number two). A preposterous success story, sounding slightly bogus to Western ears (architects can't be *that* popular) – but then many things about Kurokawa raise eyebrows and challenge stereotypes. For instance, his Herculean workday would make him the typical Japanese 'fanatic', yet he goes about it in a normal, relaxed way as if he were on a holiday. Or his immaculate dress – Gucci shoes and Cartier wristwatch – mark him as Westernized yet he is perfectly at home (literally) performing tea ceremonies in his own house. Contradiction and paradox are an everyday occurrence.



Kurokawa first came into the public eye in 1960 when, along with other architects, he founded Metabolism, an architectural movement and philosophy of change. This philosophy was invented, almost as propaganda, for the World Design Conference held that year in Tokyo. Kurokawa was twenty-six, the other architects in their early thirties. They had studied the politics of European avant-garde movements and were determined to fashion an 'ism' which would compete with those in the West.

Strangely, they were aided in this essentially elitist activity by Japanese industry which was, at the same time, aggressively trying to invade Western markets. It was hoped the World Design Conference would unify the various professions responsible for Japanese trade and give them a single style and coordination identifiable to the outside world. (This economic motive, incidentally, also led to the formation of the German Werkbund in 1907, with comparable results: a new style fusing art and industry, which would increase 'good taste' at an ever-increasing profit.) The Japanese Chamber of Commerce sponsored the affair. Kurokawa and others met every two weeks at night and discussed such designs as Kikutake's utopian project 'City over the Sea' – a series of gigantic cylinders located on what they called 'artificial land' (80 per cent of Japan is mountainous and habitable space has always been at a premium).

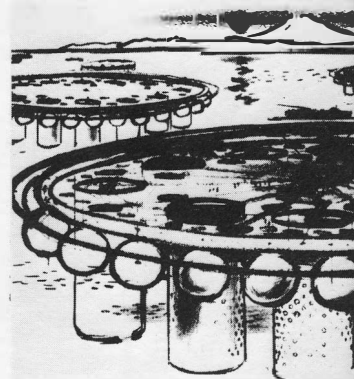
Such utopian schemes gave birth to the notion of the city as an organism which changes at various rates. Kikutake wanted to become a doctor before he became an architect so the word 'Metabolism' was coined for their manifesto and philosophy. Kurokawa, however, gives another account: he says they first evolved their designs of plug-in buildings and megastructures and then consulted a dictionary for inspiration.

At any rate, Metabolism became an extended biological analogy meant to replace the mechanical analogy of orthodox modern architecture. It compared buildings and cities to an energy process found in all of life: the cycles of change, the constant renewal and destruction of organic tissue. This metaphor was, however, not so new as it looked to the West. In many ways it was just the ancient Taoist philosophy of cosmic change and eternal growth which makes for endless variations on the same theme.

Furthermore the practice of incessant change was common to Japanese architecture with its wood buildings and Shinto shrines, which are re-created every twenty years. These shrines, of the emperor cult, are not revivals or copies in the Western sense, but nearly exact replicas whose identical form and re-creation stop time, or at least do away with historical change. In like manner, the Metabolists' philosophy of change paradoxically stops the clock. By clearly separating parts of a building or city which have different rates of change, they allow certain structures to remain undisturbed when others wear out. Their ideal is to design a city so flexible in its connections that its parts could grow, transform themselves and die while the whole animal went on living.

Metabolic theory distinguishes between different rates of obsolescence (the wearing out of mechanical equipment is faster than that of structure etc.) so that one doesn't have to destroy a whole building, or part of a city, every time one part breaks down. Kurokawa even extends this ideal of putting together highly disparate and dissectible parts to the relation between Eastern and Western culture.

(2) Kikutake's *City Over the Sea Project*, 1960; plug-in apartments on a cylindrical wall. An altered version of this was built by Kikutake for Aquapolis 1975.



'A hundred years ago, when we first began importing European civilization, people wore kimonos; to these they later added shoes. This was not a harmonious combination but it was a very good way even so. The Japanese way is to mix everything, not as a synthesis but as a *situation*. Situation is reality to us because our whole tradition is a tradition of flexibility and change. There is no real opposition to progress here because we do not decide what is right and what is wrong, or what is good and what is bad – that is a very European kind of thinking. What we do is to separate them but accept both.'

This may sound like muddled thinking, or hypocrisy, or immorality to a Westerner and probably heresy to a Christian. But as Kurokawa said regarding Buddhism and change, 'I can be Buddha, but you can't be Christ.' What he had in mind was the infinite transformation prophesied in his philosophy, the belief that one is reincarnated in every age, perhaps as a plant the first time, or an 'enlightened one' (a Buddha), the next.

'Individuality belongs to certain systems, but they must also be equal. I, me, you, tree, Buddha are equal because they have identity, *jiga*, and the same "cycle". We don't kill an animal in Buddhism. You will be me after I die – or a tree. A tree is father, or Buddha. This is the opposite of Christianity where things are each different – that is not interchangeable.'

One can see here the direct connection of Metabolist cycles of change with Buddhist reincarnation, prompting the pun that Metabolism should really be called 'Metabuddhism'. Kurokawa contrasts it in so many ways with the static notions of the West.

'We have in Japan an aesthetic of death, whereas you have an aesthetic of eternity. The Ise shrines are rebuilt every twenty years in the same form, or spirit; whereas you try to preserve the actual Greek Temple, the original material, as if it could last for eternity.'

This attempt to see man-made things as an extension of nature is the traditional idea of Japanese architecture with its organic site planning and natural use of materials left in an unfinished state. The building complex Kurokawa most admires is the Katsura Detached Palace in Kyoto, built in the seventeenth century and extended (metabolically) since then in a series of pavilions placed on the diagonal. When he took me around it, he spoke of the building and landscape in his own private language. Like so many modern architects he had a curious jargon, a set of keywords and concepts invented anew for himself.

Each pavilion at Katsura is a *jiga*, a Buddhist word for self and identity. Connect *jigas* together in an overlapping manner on their corners and you have what he calls *en* (or what traditional historians call echelon planning). *Engawa* then means the 'in-between space', the verandah space between inside and outside, or the space between two pavilions, or the street space between two buildings. In fact for Kurokawa it can mean an empty space seen positively or, the concept most dear to the Metabolists, semi-public space. As we will see on page 171, there are many meanings for *engawa* which Kurokawa ejects from his 'word-making machine'. Basically, he values it so highly because it seems to overcome the dualism of the West, the either/or logic which is alien to Buddhism.



(3) *Katsura Imperial Palace, Kyoto*. Pavilions were added on the diagonal after the first one built in 1615. Kurokawa calls these *shoin* pavilions *jiga* (or capsules) and the connecting space, the verandahs, *engawa*.

All this is really quite maddening and possibly pretentious since there is nothing very new in the idea except the neologisms, and one has to learn thirty or forty to understand what Kurokawa explicitly intends. There are 'infra-structuring and master-spacing', 'fibrous form and porous space', 'urban connectors and clusters', 'point stimulation and interiorization', enough for anyone to balk at. Furthermore, every other word in this list is roughly synonymous so we have, if I may add to the jargon, semantic inflation. And it is still worse because each Metabolist has a different set of neologisms.

And yet there are advantages. Each neologism allows Kurokawa to take over an habitual idea for himself, a necessity for an artist who is going to manipulate it in a new way. By naming ideas with new tags, not only does he shift the meaning and invent a metalanguage to discuss the new ideas, but also possesses or owns the ideas (at least psychologically). Kurokawa admits that his concepts are not the scientific categories they appear to be but rather convenient fictions which allow him to control design. They certainly allow him to give an overriding theme or unity to each work. The neologism functions as the *concetto*, or 'concept', did for the seventeenth-century Italian artist; as the unifying idea which directs the whole project. This gives Japanese architecture, as well as his work, a formal conviction usually absent in modern architecture, which is so often a compromise of endless requirements.

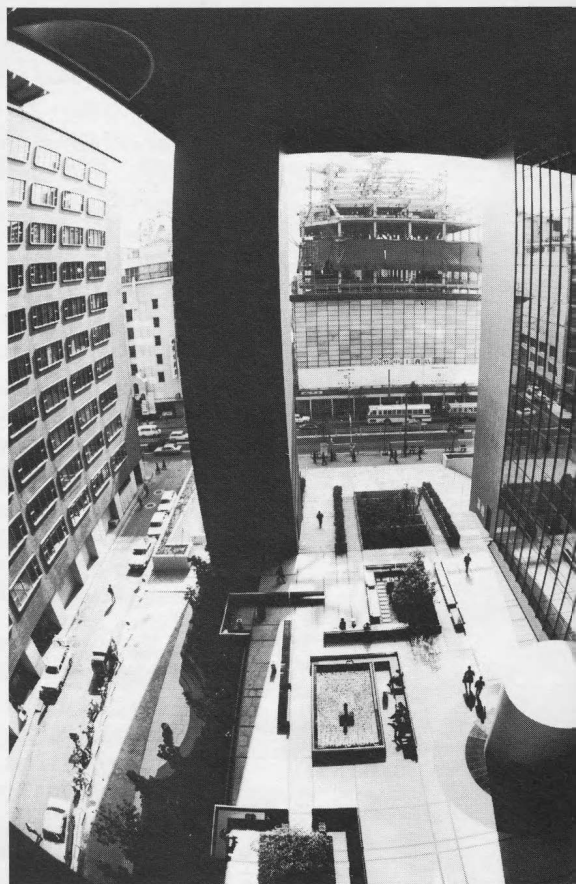
Kurokawa talks about *engawa* and his other concepts with a religious attachment – so strong that it takes the place of conventional morality, or at least the Western morality of a right opposed to a wrong position. He, in common with certain Buddhists, assumes a contradictory position, which includes evil within it. This inevitably leads to compromise or the design of questionable buildings for dubious clients. Thus I asked who he would not build for and what sort of building he wouldn't construct (a prison?).

'I will build for anyone if my concepts are realized – they come first. I have a natural way with clients; I am not pure like Le Corbusier. I accept things from society even if they conflict with my ideas – but that's ok. In another case I can make my ideas very clear. For instance, in the Hokkaido Prince Hotel I was asked to design the interior in French Renaissance style.' (A smile came over his face.) 'Well, I made a bad copy. I modified the Renaissance to reduce the cost. It's my original Renaissance, from the Renaissance. People enjoy it very much, but some architects don't like it. They create a perfect art which is pure, but not architecture which must relate to society.'

As so often, direct questions led to a series of answers which were not strictly relevant but nonetheless very illuminating of his approach. When I pointed out how Warholian he was being – 'modifying the Renaissance to reduce the cost' – he answered straight, 'I'm not so funny as Andy Warhol' – probably the truth, but his pronouncements often seemed as amusing and laconic.

(4) *The Big Box*, Tokyo 1972, has an exterior rotating façade which gives three different images, and bathroom capsules slung on one side. Around the interior *engawa* space (which has a central plastic tree) are four ethnic restaurants. The floors of this fun palace service various entertainments and sports including swimming, track, rock concerts and duck-shooting – by laser gun! Purist architects are upset at the commercialism.





“The concept of this building for a bank is *engawa* – to create some intermediate *relation* to the environment, where the people can travel into the building because it has this semi-public space (rather like a large covered courtyard). Thus it’s good for children, it’s a safe street without cars, it’s a public roof to avoid the rain. It was not necessary for the client, nor for the function of a bank, but I provided *engawa*. How can we *connect* private functions to society? This is not a problem of shape, style or artistic treatment. The Renaissance style is ok, it’s not so important. My philosophy is the main category, *engawa*, connection space and *jiga*, capsule space. People want space; and capsules as shapes or styles don’t matter.

‘My intention is to change the structure of the architectural industry, of mass production. People think my capsules are “inhuman” and that builders must construct houses by hand on the site. Like Ruskin, the humanism of a craft. But this is not humanism, it’s not good for labourers to work in dark spaces in terrible conditions on the building site. And putting bricks on top of each other is *not* a craft, it’s dehumanizing. So I design *engawa* semi-public spaces, and *jiga* mass-produced capsules to change society and labour. My concepts come first, I will design any building, except an atomic bomb factory or one used for destructive ends, as long as I can get my concepts realized.’

(5) Head Office for the Fukuoka Bank, Fukuoka, 1975, has a semi-public space, *engawa*, covered but not shut off to the community. Kurokawa distinguishes this from the otherwise similar Ford Foundation Building in New York which encloses the same kind of space.

The Organization

Later, Kurokawa told me that he actually had a 'Kurokawa Concept Committee' in his firm to see if he were being consistent in his development and whether his buildings were working according to script. I was incredulous at this, since no Western architect makes such recurrent studies of the way his buildings are being used. The idea of 'user studies and participatory design' is still with us a pious hope, whereas Kurokawa seems to be practising it as a matter of course (although to what extent I wasn't able to discover).

Basically there are three committees in his firm: the first one in charge of 'checking and evaluating space', another on 'planning' and a third the 'concept committee'.

'They ask me what's my philosophy for each building and if I can't answer they attack me. This is stimulation for me – so I always must be hot. The first committee will get buildings to evaluate and then may re-design them. It must start with my own buildings and say "How do we use this?" – then produce a long manual on the correct way of using it. Sometimes, if my client hasn't much money and there is a fault with the building, I will pay for repairs. I'll change the light bulbs and do more extensive things because the building must be used in the right way.

This is a rare and curious responsibility for an architect to accept. Usually this obligation stops the minute the building is handed over to the client – a very arbitrary and misleading point in time since any building takes years to work correctly. How much Kurokawa's continued responsibility is unique to him or shared with Japanese industry, and its paternalism, is a matter of conjecture. Both are certainly different from Western business with its sharp distinctions between public duty and private ownership.

Indeed Kurokawa's firm operates differently. Many of his hundred draughtsmen and designers work through the lunch hour and into the night; they may even sleep in the office, which is equipped for this. Kurokawa's notorious eighteen-hour working day brought the comparison with Napoleon (also like Napoleon his small stature commands a strong physical presence). And there is the usual company loyalty and personal devotion that goes with a Japanese firm created by an individual. But apart from this, there is a critical spirit which goes against the stereotype we have of such firms.

'One week, all my staff, all 140, will go a hundred miles south of Tokyo to a hotel for a three-day seminar. I will give the first lecture for six hours, from seven in the morning to one. This year the theme is architectural history. I select the lecturers from my staff, twenty in all, who will give personal histories of recent architects like Le Corbusier and Bruno Taut. If people go to sleep during the seminar, they're hit by a stick a man carries around for this job – but they don't go to sleep. Before they lecture, I give a lecture about what they will lecture on – so we prepare throughout the year.' (He notices my expression of bemused concern.) 'Of course, hitting a man with a stick is what Zen masters used to do.

'These seminars are necessary for me to communicate what concepts I have – it's very hard to communicate. This year I will explain all of my history with slides; without this communication I can't organize and my

(6) *Traditional brackets and structure* (on the Great South Gate at Nara, 1185-1382) are a source for Kurokawa's preoccupation with joints.



staff don't know what I think.' (Another smile came across my face as I imagined running a Western firm this way. Kurokawa sensed the irony and pressed his point further.) 'These seminars have been running for three years. The first one was on Baroque space and *en*, my concept of *engawa*, the in-between space. The second was on political and social problems – in what fields I am working and why.' (By now Western and Eastern notions of participation were opposed to the breaking point.) 'Last night a member of my staff changed my design for the garden of a hotel. This was terrible, because he didn't understand me – I was furious. My staff is my body – if one of them errs, I am angry with myself.'

'Myself' – the last word I expected in such a context! But Western stereotypes of Japanese society, of paternalism and conformity, are simply too crude to distinguish the peculiar mix of individual creativity within social conformity. Is a draughtsman in his firm as independent and critical as one in a large Western firm? The question is almost ludicrous, even if worth asking, because such opposite qualities have to be compared: loyalty versus autonomy; hard working hours versus comparatively leisurely work that is often monotonous; identification of the self with the architectural product versus the pragmatic connection of the hired draughtsman to the building he churns out. I don't know which system is better, but imagine Richard Seifert or Skidmore, Owings and Merrill taking their draughtsmen for a weekend in Brighton to lecture them for six solid hours on aesthetic and ethical systems enunciated first by St Thomas Aquinas and caning them if they dozed off. One is forced to think again about corporate success, because clearly in Japan it need not mean loss of vigour and creativity.

Capsules

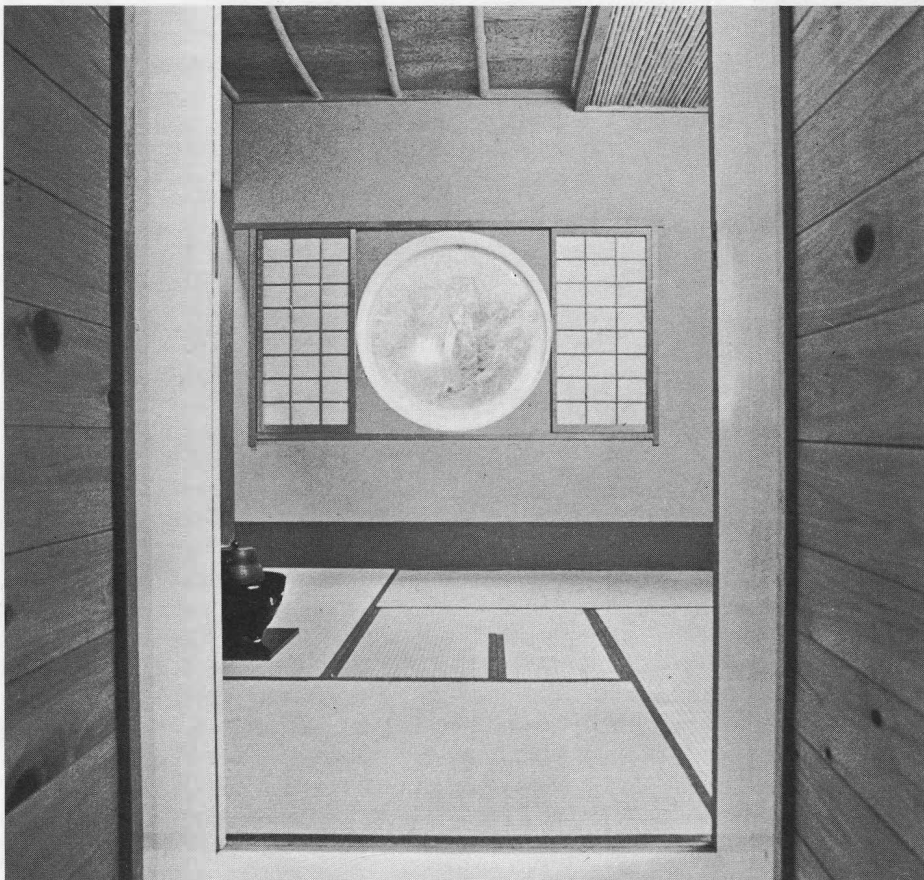
Kurokawa is often referred to as the 'capsule architect', a characterization he both encourages by polemic and deplores. 'Capsule architecture' developed from his own Metabolist researches in prefabrication done in the late fifties, which culminated in a project for a giant block which could incorporate standard elements; basically five equal elements put together like a meccano set (see *The Prefabricated Apartment House*, pages 92-4). The elements and image, while mass-produced, were actually based on traditional models of the farmhouse and *tatami* mat. It was a typical product of modern Japanese design having all the ambiguity of the figure-ground illusion: looked at one way it seemed totally futurist, from another angle totally traditional. Of course it was a combination, but one so subtle and intricate that I could not tell where the two aspects met, or even existed.

The second, genuinely Metabolist building that Kurokawa actually built was the Takara Pavilion for Expo '70 – a series of prefabricated steel capsules suspended within a cage of bent steel tubes. Here finally was the flexibility, growth and change which had been talked about for ten years. The whole building was erected in a week and dismantled quickly after Expo. There was a clear visual and technical separation between different systems and their rates of change. Above all the unfinished image with its exposed flange ends ready to grab on some new structures and capsules finally showed the world what Metabolism would look like when fully metabolic. And yet it was still, disconcertingly, traditional. The capsules were really conventional pavilions, *shoin*, and the flange ends were really these elaborate brackets found under the eaves of every Buddhist temple.

'The Takara pavilion was built in steel, which is only possible for Expo and not for housing.' (Actually Kurokawa has used steel for housing.) 'The people understand that this is the image of what can be in two hundred years – they call me a futurist and say, unfortunately, that I am the capsule architect. The people totally accept my concept . . . but then they don't ask me to build their houses.' (Almost all his work is large public building.) 'We must keep the traditional way of life and then add on something new, a capsule. We do this all the time.'

One traditional house he has built, with capsules attached, is a summer retreat for himself. Surprisingly he has seen it only twice in two years and then for a few moments; he hasn't taken a vacation in twelve years. This house is a good example of the collision between ancient and modern since one of the steel capsules, looking like a washing machine from the outside, actually contains a traditional tea ceremony room on the inside. The circular window works equally in both contexts. For this collision, Kurokawa has coined the phrase 'antagonistic coexistence' – perhaps an ironic comment on the way Russia and America should have run their foreign policy. Like *engawa*, to which it is related, antagonistic coexistence can be found throughout his work – in the joints of the buildings and in the collision of two different structural systems.

(7) Capsule House 'K'. Kurokawa's summer house at Karuisawa, 1972, is a steel capsule on the outside with imitation wooden beams on the inside. The interior here is a traditional tea ceremony room with $4\frac{1}{2}$ tatami mats and *shoji*, sliding translucent windows. The round windows, reminiscent of washing machines to us, crystallize both ancient and modern meanings, a good example of what Kurokawa calls 'antagonistic coexistence'.



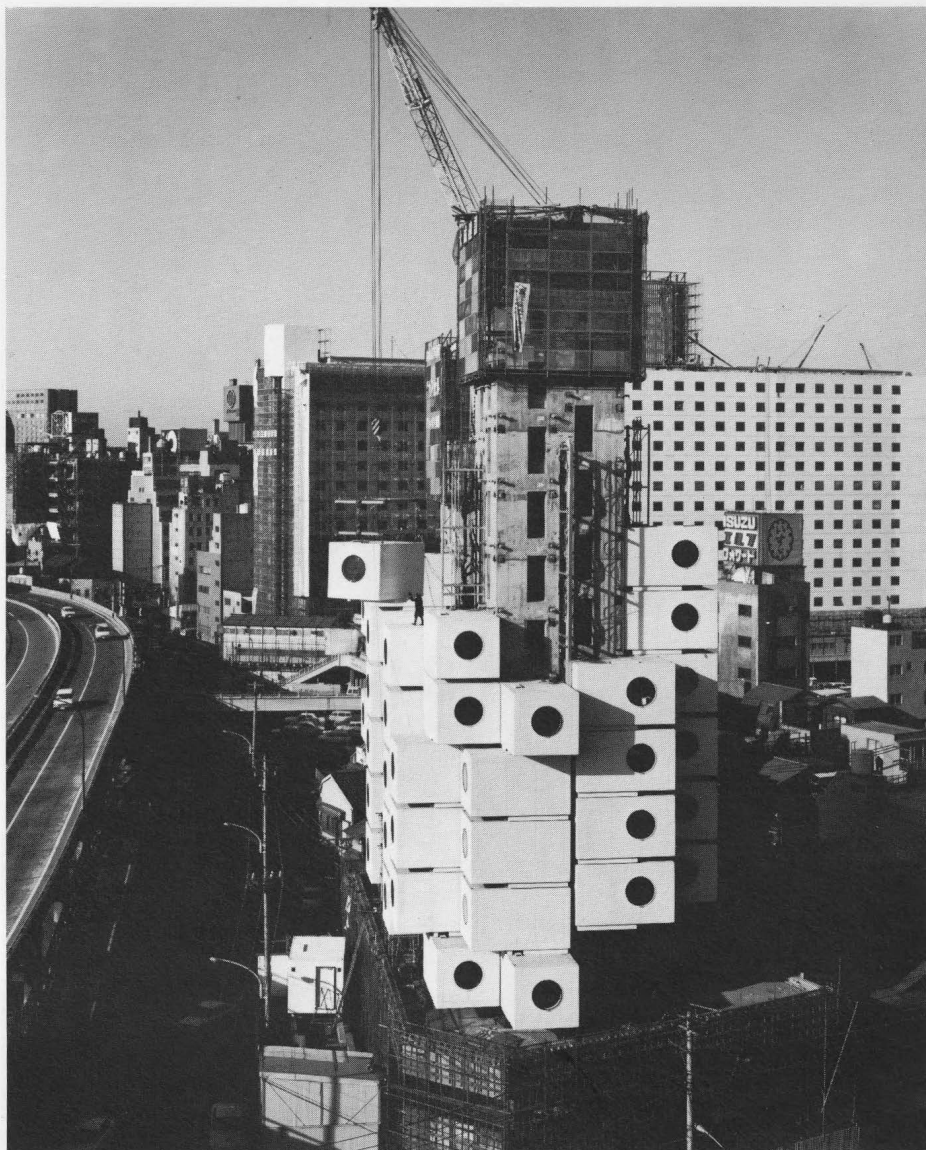


(8) Tea room at Katsura (Shokintei) shows the careful asymmetry of all elements so that none repeats and thereby becomes monotonous. The centre post has been selected for its natural bends to contrast with the eight *different* windows. A work must be unfinished or imperfect in some ways to allow the viewer to complete it, or give him freedom of imagination.

It is present in the Nakagin Tower, his most famous capsule building to date, finished in Tokyo in 1972. Here again the *tatami* proportions of the room (roughly 4 by 2.5 metres) exist antagonistically with the hardware of a totally self-sufficient space capsule. All the furniture is built in – the bedside control console, the stereo tape-deck and calculators – and yet the tiny space and proportions are the conventional ones. He combines steel capsules (modified from shipping containers) with all sorts of traditional components existing on the market. Behind this philosophy of confrontation is the idea of stimulation and the notion that Japanese life is best when challenged from the outside, from China in the ninth century or Europe and America today. His buildings often show this visually; while harmonious in part, they have unfinished elements, discordant notes, asymmetrical balance. A Westerner might find them beautiful, but compared to the sublime integration of traditional building they are assertive and imperfect. Yet here again Kurokawa is being traditional when we think he is most futurist. Tea pavilions always have to be asymmetrical and unfinished, to let the imagination complete the work.

The Nakagin Tower has 140 capsules, each sold for between £5,000–£7,000 within one month of erection. A prototype was placed on the ground and inspected before people bought them. The quick sale represents a pay-off on a financial gamble since the market was not known – except roughly as that of ‘in-town bachelors’. Actually, 30 per cent of the units have been bought by companies whose head office is in another city. When a representative comes to Tokyo to negotiate he stays in the company capsule rather than a hotel as it is cheaper in the long run. Another 30 per cent are used by families as an extension to their house – as studies, playrooms, studios or dens. This unpredicted usage led Kurokawa to a new notion (and neologism) the ‘time-community’, that is a community of individuals not based on the traditional determinants of place or location, but the different activities any individual would perform over time. A businessman might inhabit five

(9) *Nakagin Capsule Tower*, Tokyo 1972, suspends 140 rooms from two concrete cores. These steel boxes are modified shipping containers which were prefabricated in Osaka, trucked to Tokyo and lifted into place by a crane. They include every amenity which one could miniaturize and put into one room, except a stove. (The tower is in the restaurant district.)



or six different places in any one day, each of them being a momentary community. This, it turns out, is again somewhat traditional since the Japanese do not usually entertain at home, but rather take guests to one of the evening clubs that exist everywhere: transposed living rooms as it were.

As Kurokawa points out, *Homo movens*, the man who spends much of his time travelling and moving house, is a phenomenon of modern America and Japan, but, as he adds characteristically, there is a traditional precedent. The sixteenth-century poet Bashō said 'travelling is a kind of home'. Kurokawa himself spends roughly 20 per cent of his time outside of Japan and another 20 per cent in local cities outside of Tokyo – which means he spends a lot of his life in hotels, cars, aeroplanes (a point he wishes to extend generally as 'capsule architecture').

Roughly 20 per cent of the capsules are used in the predicted way by bachelors. Since the tower is located near the Ginza, the entertainment district, it is convenient 'as an executive hotel, after the businessman has finished his rounds on a late winter's night, and doesn't have the energy to return home'. The remaining 20 per cent are used in miscellaneous ways; the only buyer who has complained, a tailor, obviously hasn't read the report of Kurokawa's Checking and Evaluating Space Committee, because he uses his two capsules as fitting rooms and then objects that they don't work well as entertainment areas.

Whether or not capsule living becomes an accepted alternative in the future remains to be seen; in spite of mass production they are no cheaper than conventional rooms and Kurokawa offers them not as an economic panacea but rather as forms for a new way of living.

As can be seen in Chapter 2, he invests capsule architecture and travel with a kind of profound significance, and one that might arouse scepticism in the West. He believes that *Homo movens* will lose the age-old desire to own possessions and stately homes, and instead will go after the new status symbols of free movement and extensive credit. What's more the nuclear family will become less important as individualism and diversity increase. Capsule architecture will promote these trends. At such points, Kurokawa blends his own hopes with the projection of certain trends, possibly underrating the continued influence of traditional *mores*.

In this he is being the typical modern architect wishing to give form to a new social life that hasn't yet quite arrived, even in Japan. In spite of his hopes, the hotel and department store are not yet the 'new spiritual havens' which are equivalent to the ancestral home and religious shrine. They lack, quite obviously, the ritual and significance of these former institutions.

What business are we in?

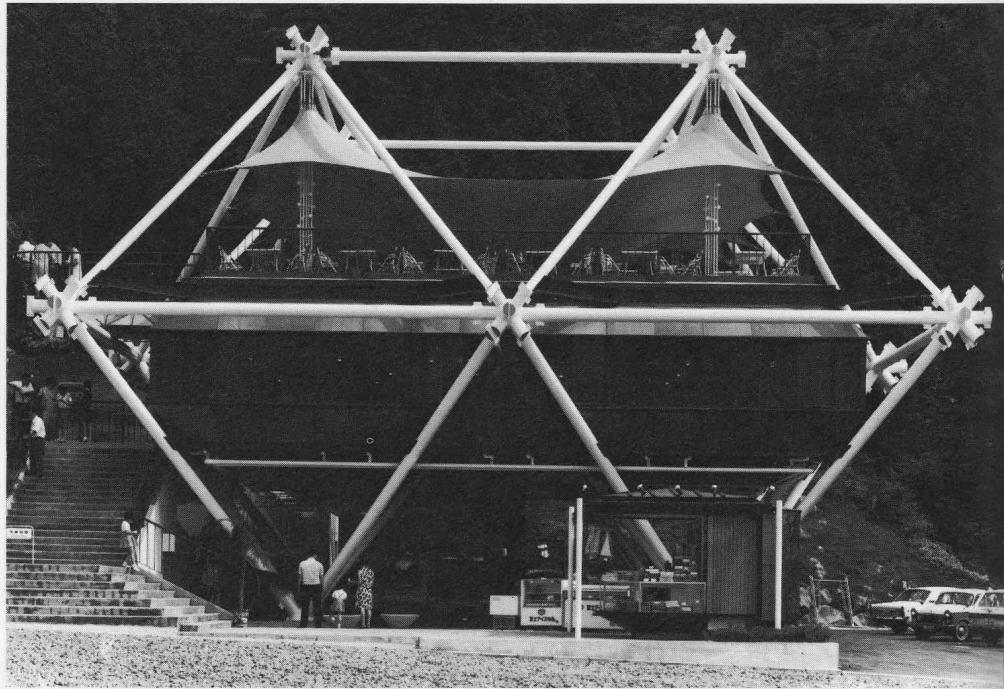
With Kurokawa's success has arisen the attractive problem that confronts growing business firms, the *shosha*, the trading and manufacturing giants such as Mitsubishi. They have become involved in such heterogeneous activity that no single person understands the whole process, much less controls it. As a result these *shosha* have developed vast information networks extending over the globe which are reputed to be quicker and broader than other information services. They keep an up-to-date flow of news on changing markets, raw materials and new ideas – an obvious necessity for a country which has no national resource except its people. In architecture there are two hundred magazines devoted to the subject, two of which specialize in importing foreign ideas. 'We import ideas and export things,' a young Japanese architect told me. 'Ideas don't cost or weigh anything, and so we can make a good balance of trade by turning these ideas into objects and selling them back to you.' An inexact statement, but one can see what he meant. On the one hand radio and tv sets assembled in Japan; on the other hand utopian ideas borrowed from architects around the world. Here some of them are built.

Kurokawa has imported the architectural notions of Jane Jacobs and Team Ten as well as the techniques of Herman Kahn and the Rand Corporation.

'In Japan there are forty to fifty people actively engaged in thinking about the future. I am the chairman of the Think Tank Association, which

(10) The *Odakyu Drive-In Restaurant*, Otome Toge, 1969, was the first Metabolist building that really *looked* changeable: a giant, white space frame holds a red tent and brown capsule dining room. The exaggerated joints not only startle the passing motorist (roadside architecture) but are designed to be easily added to or dismantled.

The joint swallows the building and the building swallows the joint (it is a restaurant). Actually, the antagonistic coexistence is the relation between the harmonious space and the inharmonious joint, which is placed dead centre in the restaurant.



includes one hundred small, informal groups and five large ones. Every week my group, the Institute for Social Engineering, has a meeting. Various governmental ministries give us money and we make specialized studies such as how the economy will grow across different social groups, or whether to manufacture many VTOLs [vertical take off and landing planes necessary for Japan's mountainous regions]. We also make general predictions for the year 2000 – and we foresaw that Japan's GNP would pass Germany to become number two in the world.'

In the West 'social engineering' has unattractive overtones and Think Tanks have had a dubious political involvement. His approach would be termed technocratic and associated with the right wing. When asked about the political implications of his Institute Kurokawa commented:

'No, that's not same here. Both Tanaka of the right wing and Minobe of the left, that is both the prime minister and the governor of Tokyo, say, "Kurokawa agrees with me." Tokyo is occupied 60 per cent by the left wing and the National Chamber is 60 per cent right wing; the city is left, the whole is right. That's a good combination. Attacking is a good training for people, to hear both opinions.

I am not left side.
I am not right side.
I am an architect.
I attack both sides.'

This nice little jump into doggerel seemed evasive at first, another example of the Buddhist dream of having it both ways at once. But on further reflection and questioning I saw how inadequate was the dichotomy – capitalist/socialist – applied to him. His way of life and tastes were

capitalist, but many aspects of his firm were socialist and furthermore he did seem to attack both sides with a certain consistency.

'Tanaka wrote a book about the Revolution of Japan, how to change it by building many expressways, and decentralizing by 1985. A popular magazine asked me to reply and I wrote an article against his policy.* I said rapid growth is very harmful for Japan and we should not rebuild every home by 1985, that would make impossible living conditions. Decentralization of urban areas is also bad because that would destroy local culture. Pollution and traffic jams may be bad but they're better than killing local culture. Tanaka promoted decentralized industry, but my research institute showed that industrialization is not the key. By 1964 we had become a post-industrial society in terms of statistics and work force. Maybe, I said, we should increase tertiary industry, administration, university research, etc., and centralize commercial expertise. We will have 15 million new people by 1985 and this amount I don't want to live in the big cities – so there will be a two-way flow.

'After several criticisms, Tanaka asked me to debate with him on tv. He said on tv that a city must be a certain size and have 250,000 people. I answered that cities must have many different scales, an opinion backed up by many different experts. Decentralization failed once again.'

A certain pride conveyed through this matter-of-fact description was not surprising. It would be hard for Kurokawa to describe himself without boasting. How can you list membership in twenty-seven different societies and government committees in a humble way? Underneath all this effort must have been a new version of a traditional fanaticism, so it was not surprising when Kurokawa said that the person he respected most in modern Japan was Mishima. Japan admires a man who goes to extremes for an idea and is always ready to make a hero, as it has with Onoda, who spent the last twenty-five years continuing to fight the Second World War until he was personally pardoned from this duty by the Emperor.

But 'fanaticism' is again a Western construct on the matter and it does not seem to apply to a person who is so gentle, unassertive and, on the surface, well balanced. In fact, humble at times. But again perhaps there is a Buddhist tradition behind this; the way one is supposed to transcend ego in total involvement to become at once selfless and the top Buddha. When Kurokawa is criticized it is because he is too perfect; one imagines that, like James Bond, if he were in a street fight not a hair would be knocked out of place that wasn't carefully premeditated in its disarray. Naturally many people, especially architects, are jealous and he has been slandered in various ways.

One newspaper report said a city hall he had designed was beginning to sag, because the cantilevers hadn't been calculated right; another said he fathered a child with a famous actress; another that he was a rich man who received one million dollars for a rough sketch design.

This kind of personal vilification brought a serene smile to Kurokawa's lips, as he relished the jealous hatred he could inspire. He was above the crude, negative tactics of his enemies; he was triumphant and had no need of underhand activities. After all he had to turn down most of his architectural offers, he had to refuse 900 invitations to lecture per year, while Tange,

* The policy failed partly because Tanaka wrote the book revealing his plans thereby pushing up the land values.

the previous giant of Japanese architecture, was in Saudi Arabia looking for work. I was reminded of the bitter struggle during the Renaissance, Benvenuto Cellini's boasts and intense competition; he always had to prove he was the best artist. 'Every day I must prove I can do it.' Kurokawa said of his architecture. 'Some Japanese architects don't think I can produce good architecture because of my Think Tank and planning, so I must show them and work eighteen hours a day.'

With this remark a large chunk of the puzzle falls into place. It reveals one reason for his extreme motivation and the way this keeps his various activities from flying apart into the formless growth of a *shosha*. Why also the seminars are so necessary: they integrate 'Kisho Kurokawa, Architect and Associates' into one body with many limbs, many information antennae and one head. That evening, as Kurokawa was taking me from one club to another in the Ginza district, we came across a demonstration against President Ford's impending visit. A line of white-helmeted youths was running down the street, each individual holding on to the one in front, burying his head while running, the whole agitated centipede being chased by police in black helmets and armoured vehicles. I asked naïvely why the youths held on to the line and then saw what happened if they didn't. As soon as one became unattached from the white group, he would be ritually pummelled and absorbed into the black group, the whole silent dance between the two groups taking place without any personal expression. Apparently the individual in Japan can express almost any shade of opinion he wishes as long as he does it by joining the means of expression, the group.

Finally, the most surprising thing about Kurokawa is that he is kind, a good listener and humble. A cynic might point out that with all his success he can well afford to be humble, or that these qualities have aided his career – which they no doubt have. Still, their existence is unexpected. If he were Western, his drive and ambition might have made him aloof and aggressive, or perhaps distorted and specialized in some way. But there are no obvious exaggerations to his character, no compensations which we have come to associate with such men. In fact Kurokawa's main contribution for us may be in combining aspects usually taken as mutually exclusive in the West: the futurist and traditionalist, the paternalist and libertarian, the successful businessman and artist, a man who innovates on many different levels, yet unlike a member of the Western avant-garde is a popular and accessible person. These are just a few of the Western oppositions he has merged, if not overcome. Perhaps it is simply a case of Eastern culture taking its course when confronted with Western ideas and technology, the ritual emphasis on complementary qualities, yin and yang, feminine and masculine. In any case Kurokawa forces us to re-examine stereotypes that go back at least one hundred years, not only concerning Japan, but about what an individual can be.

C.J., London 1976

Chapter 1

1 The Philosophy of Metabolism

War helped me discover Japanese culture. As I stood amidst the ruins of Nagoya, the third largest city in Japan, there was nothing but scorched earth for as far as I could see. In contrast to the desolate surroundings, the blue of the mountain range on the horizon was dazzling to the eyes.

My father was an architect. After graduating from the Nagoya Industrial college he went to work for the architectural department of the Aichi Prefectural Government and later became chief architect in the architectural department of a private firm. At the end of World War II, when I was only eleven and still in primary school, I already felt myself strongly drawn to architecture. I remember that my father's library contained works on classical Greek and Roman architecture and many volumes by writers such as John Ruskin and William Morris. Reading books of this kind formed in my mind an image of architecture and of cities as entities which are eternal and do not lose their eternal quality even if they are destroyed.

Very little was left of the Japanese cities destroyed by the air raids of World War II. Much in cities in the West is built of brick and stone, which remain as heaps of rubble after the buildings themselves have been destroyed. In Japan, on the other hand, building is mostly of wood (today 80 per cent of the buildings in Tokyo are wooden) and consequently destruction usually levels Japanese cities to the ground. But even then the buildings and cities persist as vivid images in the minds and imaginations of the people. And it was in this sense that I first came into contact with several major characteristics of Japanese culture, after I had lost my home town in the war.

Taking 1867, the year of the Meiji Restoration in response to pressures to open Japan up to the West, as the start of Japan's modern age, we may divide the country's history up to the present into four generations. The first generation was that of the founders of the modernization and Westernization movement. These were the leaders of Meiji Period society, and they founded a large number of private universities, enterprises, and industrial organizations. In architecture this generation introduced a modern educational system to replace the old apprentice system of carpenters and other construction workers, by establishing a national engineering school—called the National Kōbu Daigakko. Among the first graduates of this school were Kingo Tatsuno, Yorichika Tsumaki, Tōkuma Katayama, Yuzuru Watanabe, and Tatsuzo Sone. These men copied Baroque, Renaissance, and other European architectural styles in designing banks and government buildings. To their way of thinking, the modernization of Japanese architecture meant the introduction of Western styles without any modification at all. They advocated without hesitation that the true modern Japanese architectural style was the Renaissance, the Baroque, or whatever other style they were copying.



(1) Central Bank of Japan, 1896, designed by Kingo Tatsuno

The second generation saw the development from the successful achievement of an industrial revolution in Japan, to the Old Liberalism often referred to as Taisho Democracy (the period from 1912 to 1926 is called the Taisho Period), the growth of jingoism, and finally to the war and its conclusion in defeat. Among the architects of this generation were men like Shin'ichiro Okada who tried to incorporate traditional Japanese styles into Western ones. For example, they would cap reinforced concrete buildings with old-fashioned tile roofs. Some architects, such as Sutemi Horiguchi and Mamoru Yamada, came under the direct influence of contemporary European art movements including Art Nouveau and the Vienna Sezession. Establishment of the greater East Asia Co-prosperity Sphere during World War II was regarded as an opportunity to export ultra-nationalistic Japanese architectural styles, which would be a sign of Japanese authority. The document of surrender, however, was the death notice for this ultra-nationalistic architecture.

In addition to reconsidering the validity of blindly copying imported styles, architects at this time also witnessed the downfall of ultra-nationalism and the destruction of national self-confidence brought on by defeat in the war. The third generation of Kenzo Tange and Kunio Maekawa have created a special world for themselves because they began their truly creative work only after the end of World War II, and were able to respond to the changes wrought in architectural style.

I belong to the fourth generation, whose point of origin is the defeat and destruction in the war. For this reason we are sometimes called the Charred Ruins School. In the hearts of all the members of this generation are traumatic images of events that took place when we were in our formative childhood years. The sudden, tragic destruction of Hiroshima and Nagasaki by atomic bombs and the virtually total reduction of cities and buildings to ashes.

Ours was the first generation to be educated in the totally new post-war system. Indeed, for a period shortly after the end of the war most of the pages in our old textbooks were inked out because their contents were no longer considered suitable.

The architectural models in our minds no longer included the classical European architecture which had interested me in my father's books. Nor were the ultra-nationalistic designs of my father, including the Aichi Prefectural Government which had been spared the flames of war, of any great significance to me. One idea which may well have taken their place in my training is Buddhist thought, since my parents were believers in Jōdo Buddhism and were supporting members of a temple of the sect. Furthermore, the head of the Tokai Gakuen, where I attended junior and senior high school, was the distinguished Buddhist priest Benkyo Shio, who later was the chief abbot of the Zōjōji in Tokyo. Buddhism later exerted great influence on the architectural philosophy I developed.

When the time came to select a university there were good reasons for choosing Kyoto University. I had been strongly impressed by the interpretation of the social significance of architecture that I read in a book, *Housing Problems in the Future*, written by Uzo Nishiyama, who was a professor at that school. Nishiyama was attempting to employ sociological methods to derive a new, scientific, planning theory to clarify the social meaning of architecture. His philosophy and methods were extremely fresh and exciting. During my four years in college I studied many subjects outside the architectural curriculum and, under the guidance of Professor Nishiyama, participated in social studies of slum areas. But when I learned that the architecture which results from scientific design theories based on such social investigations does not invariably produce fine works of art I made up my mind to leave Kyoto University. I decided to attend graduate school at Tokyo University, where Kenzo Tange (a practising architect, unlike Nishiyama) was teaching. I spent seven years there studying for the master's and doctor's degrees.

It was not until the 1950s that modern architecture made its real debut in Japan. Maekawa and Tange produced no works before World War II, but became very active during the latter half of the 1940s. It was especially interesting to me that Tange's initial work in this period was the Peace Centre in Hiroshima. I found it meaningless to attempt to revive an already destroyed city by means of a monument, I felt that it was important to let the destroyed be and to create a new Japan.

The architects of the first of the four generations were confident that they were right in attempting to introduce and to copy Western architectural styles. The generation of Maekawa and Tange was equally confident that they were right in their efforts to introduce the philosophy of CIAM and Le Corbusier. In my view, what these men were doing led to confusion and conflict. But architects of the fourth generation, including Kiyonori Kikutake, Arata Isozaki, and myself, refused to take part. Instead, we



(2) Head office of Aichi Prefectural government, 1938

elected to observe the proceedings from the stalls. We did not take action until the second half of the 1950s.

It was decided that in 1960 the World Design Conference would be held in Japan. Because we were involved in planning the conference, Takashi Asada, general secretary of the conference, architectural critic Noboru Kawazoe, architect Kiyonori Kikutake, and I, found it necessary to meet and hold discussions almost daily. At this time we began to think about the significance of the fourth generation.

During the first half of the 1960s Kenzo Tange designed the Yoyogi National Gymnasium, one of his masterpieces. At about the same time Japan entered a period of astounding economic development that was to last for more than a decade. Not only did this growth strengthen Japan economically and politically, it also, for the first time in history, upset the old Japanese social institutions and gave birth to a mass-oriented society. New people became prominent in all fields, new art movements that refused to be bound to the established orders appeared. For us the confusion produced by those changes provided an excellent opportunity to think about and act upon the cities and buildings that had been destroyed in the war. Confusion in the city made it impossible for monuments or symbols to control or dominate urban spaces. Elements that mutually contradict, oppose, or operate in parallel make the character of cities and architecture multivalent and ambiguous and render visual comprehension of the whole urban landscape impossible.

The Metabolic movement began against this kind of social background and came into being through the preparations for the World Design Conference. These preparations lasted for two years, beginning in 1958, and during the conference the Metabolist group made its first declaration. *Metabolism 1960 – a Proposal for a New Urbanism*. The people who collaborated on this book were architects Kiyonori Kikutake, Fumihiko Maki, Masato Otaka, and myself, and graphic designer Kiyoshi Awazu.

A key passage in this declaration reads. 'We regard human society as a vital process, a continuous development from atom to nebula. The reason why we use the biological word *metabolism* is that we believe design and technology should denote human vitality. We do not believe that metabolism indicates only acceptance of a natural, historical process, but we are trying to encourage the active metabolic development of our society through our proposals.' This is an important element in our declaration for two reasons. First, it reflects our feelings that human society must be regarded as one part of a continuous natural entity that includes all animals and plants. Secondly, it expresses our belief that technology is an extension of humanity. This belief contrasts with the Western belief that modernization is a repetition of a conflict between technology and humanity.

The Japanese physicist Hideki Yukawa, a 1960 Nobel Prize winner, wrote in a newspaper article that religion and science ought not to be thought of as different worlds but that they should be recognized as being connected in a single cycle. This idea should not be new to the Japanese, who have become familiar with it through the long history of Buddhist culture.

Our group hoped to focus discussion on new issues by introducing elements peculiar to and characteristic of Japanese culture into the history of functionally and rationally organized modernization. At the conference I presented a report entitled 'Character in design stems from the universality of new quality' in which I argued that the way to create a character for Japanese design arises from a good use of the Japanese understanding of the continuity and harmony of technology, humanity, and nature in modern society. In addition, such a character gives Japanese design universal validity. By seeking international styles and standards it is not possible to create a style both Japanese and of universal appeal. (This topic is discussed in my book on the conference, *WodeCo, 1960*, published in 1960.)

To understand the philosophy of the Metabolist group better, it is

necessary to give a brief outline of pertinent characteristics of Japanese social history

Specifically, we must look at population trends, mobility, and the technological orientation of modernization. First, the population of Japan in 1721 was 31 million. At that time the power of the Tokugawa shogunate, which ruled the nation throughout the Edo period (1615-1867), was at its height, with Yoshiyasu as the current shogun. For the next century and a half, the population varied between 31 and 33 million. After the modernization that began in full force with the Meiji Restoration in 1867 the population began to increase sharply. Between 1875 and 1975, it tripled, to reach the present level of 105 million. According to a projection made by the Institute of Social Engineering, by the year 2000 Japan will have a population of about 135 million. Although increases in the birth rate contribute to this growth, the most significant factor will be the increase of elderly people as a percentage of the total population. Indeed, modernization of the environment, advances in medical science, improvements in health and medical care systems, all supported by and fostered by growth and development of the economy, are so lengthening the average life span that soon Japan will probably have the largest elderly population, relative to the total population, of any country in the world. No developed Western nation shows a population growth pattern - an ageing - of this kind.

Obviously growth of the population and change in the age structure of the population greatly influence the nature of cities, types of residence and nature of architectural spaces. Furthermore, the speed of population growth has made it impossible to satisfy housing demand through the ordinary construction methods of the past. Consequently, the residential environment has deteriorated. The need to provide an annual minimum of 1.6 million dwellings at minimal cost has become a pressing social issue. In Japan, therefore, there has been a strong demand for the industrialization of residential building which has then become a vital subject to the architect. It is to be wondered whether even a shift from high-level economic growth to a long period of low-level growth will affect the dynamic conditions of change in Japanese society. As long as these conditions persist the architect must not accept them passively, as the inevitable results of technological progress. Instead he must help people to master technology and strive to produce a system whereby changes occur as the result of human judgement. The architect's job is not to propose ideal models for society, but to devise spatial equipment that the citizens themselves can operate.

The second Japanese social characteristic of importance here is the mobility of the Japanese people. Since antiquity, the capital of Japan has been moved on a number of occasions, for political or religious reasons. Nara, Kyoto, Kamakura and Tokyo (then Edo) have each in turn been the capital. Another example of the way the Japanese accepted mobility was the requirement which the Tokugawa shogunate made of the clan lords (*daimyo*), who were required to spend each alternate year in the capital city. This entailed a great deal of coming and going on the part of the lords and the members of their households. Still another example of the readiness with which the Japanese people move about is the long-established custom for agricultural workers to migrate to cities to seek employment for periods when farm labour is not needed in the rural areas. Even today, when the income differential between the town and country has practically disap-

peared, this seasonal shift of the labour force continues all over the nation. Traditionally, religious pilgrimage and travel have occupied an important position in the way the Japanese people spend their leisure time. Pilgrims' associations were even set up, organized on a regional or village basis, to manage funds saved for travel expenses. Travel and pilgrimages to the various temples and shrines in many parts of Japan led to new friendships, study, and cultural exchange among various regions, and even to the formation of a kind of sex industry. Nor was travel only for the masses. Intellectuals found travel a way to free themselves from the opposition imposed by authorities and to lead a life of refinement and taste. One of the best works of the famous *haiku* poet Matsuo Bashō (1644–94) is a kind of poetic travel diary, *The Narrow Road of Oku*. He often said that travel was his home.

Today two types of mobility are still features of Japanese life. First, 10 per cent of the population changes its place of residence each year. Second, mobility is of great importance in the daily lives of wage-earners and students who must travel from home and back, twice daily, and the lives of those who are active in clubs, associations, and recreational organizations and the like. So inherent is the love of mobility to the Japanese character that until only recently most Japanese preferred to take their families to public bath houses instead of building a bathroom or installing a tub in the home. Even today some families drive to local public baths. This readiness to move contrasts with the more settled system of Europe, where life is focused on the home, extending out to a settled local community. In a book called *Homo Movens* (1969) I contrasted this fluid society with the closed community of the West and suggested that the Japanese way suggested possibilities for a new kind of living space.

The history of Japanese modernization is at the same time a history of urbanization. Nowhere in the world is the population more concentrated in cities than in Japan. 50 per cent (50 million) of the population lives in and around Tokyo, Osaka, and Nagoya, 10 per cent live in Tokyo alone. The rapid economic growth of the nation since 1960 has intensified the concentration of the population in cities and has consequently aggravated pollution problems. It is forecast, however, that in future the drift into the major urban centres will slacken and that there will be a movement to cities of moderate size. By the year 2000 the population shift to the major cities will have halted, and 30 million people will have moved to regional cities. Without doubt, such a violent ebb and flow will work immense changes in Japanese society. Even should population flow into the large cities and into the regional cities cease, the Japanese fondness for mobility will continue to demand dynamic spatial compositions.

In 1970 the Japanese government had a development plan for the entire nation prepared. I participated in the production of the plan, which took the mobility of the population as a premise and linked all the nation's cities by means of a transportation and information-communications network. I further proposed the formation of a network of individual cities. Indeed, the creation of a nationwide network is already in progress in the form of widespread use of automobiles and ownership of television sets, the system of super-fast express trains, and the construction of expressways. Despite the irregular terrain of the Japanese archipelago transport systems and facilities are excellent. They include a national network of air service, ferry and cargo transport service by ship, super-fast express trains, and older

regular railways. Their very excellence is indicative of the Japanese fondness for mobility and movement.

Le Corbusier said that cities consist of living spaces, working spaces, and recreational spaces connected by methods of transport. Methods of transport should be re-examined as parts of the space in which we live. Here, the important feature is not the road, which has the sole function of providing a place for vehicles to pass, but the street, which is part of daily-life space and has many functions. In 1960, before working on the design of the Nishijin Labour Centre, I undertook a study of Japanese city streets – particularly those of Kyoto. After the Nishijin centre was completed (in 1962), I published an article, 'Architecture of the Street', in a Japanese architectural magazine, (see Chapter 3). In this I discussed how one characteristic of Japanese architecture and cities throughout their long history has been the development of methods for using places designed to facilitate movement – corridors, streets, and so on – as an integral part of daily life. The verandah of the Katsura Imperial Palace (built in the seventeenth century) and the corridors of temples are more than mere passages between one room and another

A study of the streets of Japan's ancient capital, Kyoto, showed that the organization of the streets provided a useful contrast between Western and Japanese cities. *Urban Design* (1965) argued that the traditional Japanese city lacks squares or plazas as its streets serve the function of plazas. Jane Jacobs, in *The Death and Life of Great American Cities*, makes the same observation.

Seen from a different angle, the fluidity of Japanese society stems from its homogeneity and its history of centralized authority. In contrast to Italy and Germany, both of which became nations through the unification of city states or principalities, Japan has a long history of repeated concentrations of central authority. The Japanese pyramidal power structure has discouraged people from living in fixed places within regions, as was the case in nations composed of city states. Japan has known very little of the kind of warring that set one city state against another elsewhere in the world. Traditional Japanese society is basically egalitarian and is homogeneous in that there is little class distinction in the usual Western sense and all people have an equal chance of rising to power. There has been little need to form groups or communities on the basis of race or class to protect vested interests. These conditions have made it possible for the Japanese to move about with freedom wherever they have wanted to travel.

The third characteristic of Japanese society is the importance of technology and its influence on the body politic. This is illustrated by the Meiji restoration, when the shogun, the master of Japan for centuries, was removed from power and the emperor, previously only a figurehead, took his place. These changes arose from a recognition of the need to alter the political system in order to open Japan to Western influences and in this way to introduce Western technology and promote the industrialization of the nation. Some political change was necessary for Japan to become capable of absorbing a new way of life, but the historical tradition was kept intact, the event is tellingly referred to not as a revolution but as a restoration. The people who wielded power in the new government were eager to adopt Western technology but without Western philosophical rationalism or Western social systems, they intended to incorporate bare

technology into the old Japanese tradition. This attitude was extremely optimistic, we can understand it when we remember that these men saw technology, humanity and nature as forming a single ring. They did not imagine that technology could be in opposition to humanity and nature, or that it could bring harm to mankind.

The scale of the technology that has been introduced into and developed by Japan since 1945 has been immense. Industries like shipbuilding, steel production, automobile manufacture, and electronics have so grown and developed as to acquire autonomous power sufficient to affect the entire nation. At the same time that the rapid economic development of Japan began, in 1960, the Metabolist group advocated the creation of a new relationship between humanity and technology. Thinking that the time would come when technology would develop autonomously to the point where it ruled human life, the group aimed at producing a system whereby man would maintain control over technology.

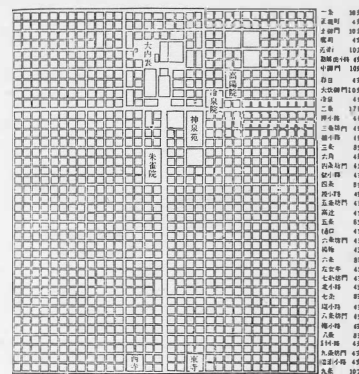
Rapid economic growth in an industrial nation such as Japan promotes the development of technology of a kind more dynamic than anything previously known. As long as such economic growth continues, even production facilities completed only a few years previously can be made obsolete and replaced by newer facilities. This process can go on reproducing itself. Similarly, spaces that are still capable of serving society adequately are rapidly abandoned in the search for newer, more highly effective and serviceable spaces.

In this no thought is given to the social significance of spaces or to value judgements about providing people with pleasing symbols. The sole consideration is economic efficiency and profit. We advocated the application of metabolic cycle theory as a way of avoiding these conditions. This theory proposed a reorganization which divides architectural and urban spaces into levels extending from the major to the subordinate and which makes it easy for human beings to control their own environments.

By distinguishing between the parts that do not change and the parts that must be preserved, it is possible to ascertain the parts that must periodically be replaced. In our plan for a prefabricated apartment building project (1962) (see pp. 92-4), we devised a way of assembling a number of basic elements so as to create such major spaces as bedrooms and living rooms. Capsule units, attached from the outside, were used for subordinate spaces like those of the kitchen and the service units. This kind of breakdown and recombination of architecture enables individual expression and the production of character for the individual rooms and their contents, it establishes a kind of identity by means of things that, in the case of buildings in the modern architecture style, were buried within box-like forms.

The intention in using this method is not merely to apply industrialization and prefabrication to mass-produce spaces at low cost. It is intended to make use of prefabrication techniques to restore to architectural spaces something of the characteristics and feelings of the individual human being – characteristics and feelings that are lost when architecture is made anonymous and impersonal. The Nakagin Capsule Tower (pp. 105-9) is not strictly an architectural expression of an apartment house, it is an expression of the 144 people who reside in its 144 units.

Although Metabolism emphasizes the principle of replaceability and changeability of parts, the reasons for doing so derive from a philosophy



(3) Street Pattern in Kyoto

entirely different from the use-and-discard approach sometimes justified by economics in mass-consumption societies. I know of many instances in which entire buildings have been wastefully destroyed because portions of them were no longer serviceable. If spaces were composed on the basis of the theory of the metabolic cycle, it would be possible to replace only those parts that had lost their usefulness and in this way to contribute to the conservation of resources by using buildings longer

For still other reasons, technology will continue to be important to Japan in the future. One of these reasons is Japan's dependence on imports for more than 30 per cent of her food and more than 95 per cent of her energy. To guarantee the living standards of her people while relying heavily on other nations for such basics as raw materials and primary energy resources, Japan has no resource but to put the human brain, and technology, to full use and to export the industrial products thereby obtained. Technology is both rice and oil to the Japanese people.

Geography accounts for still another aspect of the Japanese reliance on technology. Japan consists of 37 million hectares of land, of which only one fifth is flat, the remaining area is mountainous. Of the flat area, 6 million hectares are devoted to agricultural use, and 1.1 million hectares are rivers, lakes, or other areas of water or marsh. To increase food production, even by a slight degree, non-agricultural use of land has to be minimized. The area available for human habitation, including that used by railroads, highways, and other social infrastructures, is a mere 2 million hectares. This is the area on which 105 million people live today and on which, by the year 2000, 135 million will probably make their homes.

Land in Japan is more expensive than in almost any other part of the world. The high density of economic activity partially accounts for this phenomenon, but overall shortage of land is also an important factor. Without considering these special conditions, it is impossible to grasp the full importance to Japan of technological development in high-density building, man-made land, cities over the sea, and high-rise structures.

The fourth characteristic of Japanese society is its reliance on wood in contrast to the reliance on stone that characterizes cultures of the West.

(4) The naigu of Ise Shrine

(5) Aerial view of Ise Shrine



The foremost symbol of the Japanese wooden building is the Ise Shrine. The buildings of the shrine are prototypes, and for a thousand years their basic forms have been preserved unaltered. But to preserve the prototype it has been necessary to replace the buildings with exact replicas at twenty-year intervals. The buildings at Ise today, therefore, are not original in the sense of being composed of the materials from which they were first built as the temples and other buildings on the Acropolis are original. Since wood, the traditional building material, rots easily, the Japanese have never felt that the materials themselves have a sense of eternity. On the contrary, they are and always have been conscious of the spirit and philosophy beyond the materials and regard the form as an intermediary conveying that spirit and philosophy to human beings. The faithful reproduction of the Ise buildings may be thought of as a ceremony through which the philosophy and spirit of the old buildings are transmitted into new spaces.

The carpenters of the past, who were the equivalent of architects until Western architecture was introduced, did not draw plans but relied on written instruction sheets called *sashizu*. They were able to build successfully on the basis of nothing more than *sashizu* because of the existence of a system of standardizations (*kiwari*) and detailed specifications (*shikuchi*). Furthermore the workmen could see and feel the rebuilding and replacement process in the finished building. Such is the strength of this tradition that several wooden masterpieces from as early as the seventh century remain standing today.

Japanese cypress (*hinoki*) is used in many Japanese bathrooms to surface walls and for the bathtub, so that the pleasing fragrance of the wood can be enjoyed. To introduce the tactile pleasure of the material into daily life wood used elsewhere in private homes is rarely stripped of its bark and finished to mechanically precise smoothness. In short, wood is regarded less as an architectural material than as a part of the world of nature. The use of bark-edged trunks and limbs of trees in *tokonoma* alcoves and ceilings of rooms and huts for the tea ceremony reflects this same pleasure in material.

The feeling of unity with nature extends to materials other than wood. When the bronze fittings have acquired a patina, and the thatch roofs have become speckled with moss, then they acquire special value because these alterations reveal continuity and unity with nature. The aesthetic fondness for the plain, unadorned, natural, rustic, and slightly sad, expressed by the word *sabi*, is related to this sense of values. My own term for this aesthetic philosophy is 'the aesthetics of metabolism' or 'the aesthetics of time' (*Aesthetics of Metabolism*, 1967) – terms selected to indicate a philosophy which finds value in the preservation of relations between architecture, society and nature while constantly changing with the passing of time. The relation between society and nature is an open one. Beauty is not created solely by the artist, it is completed by the citizens, the users, and the spectators, who by so doing contribute to its creation. I employ industrialization, prefabrication, and capsulization as ways of evoking this kind of participation. The technology of movement (mobility) can also be used as a participation system.

I believe that what I call media space (or *en*-space, a term using the Japanese word *en*, which means connection or relationship) and in-between space are important in making the relation between architecture, and society and nature an open one (see Chapter 4).

In my Central Lodge (1964), Memorial House for Hans Christian Andersen

(1965) and Sagae City Hall (1967), I made very high ceilings for the space they created and natural lighting through skylights to establish a sense of continuity between the buildings and nature. In the Yamagata Resort Centre (1967), the Daido Insurance Building (Sapporo, 1975), the Head Office of the Fukuoka Bank (1975), and Waki-cho City Hall (1975), I employed in-between spaces, which are neither exterior nor interior, to establish continuity between the buildings and their surrounding environment.

This philosophy of continuity, characteristic of wood-based culture, is lacking in stone-based culture. Instead of using the material in such a way as to make full use of its natural characteristics, stone-based culture processes the material, and physically alters it. For instance, stone cut to make sculpture no longer seems to be stone at all. In this respect, Greek and Roman architecture would have been the same if it had used steel and concrete instead of stone. Furthermore, unlike wood-based culture, stone-based culture opposes nature, its architecture uses walls to protect the interior from the exterior. According to this approach, architecture and nature are discontinuous. Human beings do not live with architecture for architecture is only a container for human beings. This aspect of the traditional stone-based culture is directly connected to modern rationalism and to functionalist architecture.

Undeniably, rationalism, functionalism, and individualism have benefited modern society, but they have also produced great losses. It is now time to incorporate in contemporary architecture the kinds of anti-dualism, anti-functionalism, and anti-individualism latent in wood-based culture.

The fifth characteristic of Japanese society is its Buddhist culture. Buddhism was introduced into Japan from the Asian continent in the sixth century. In the twelfth century a number of distinctly Japanese Buddhist schools were established. Jōdo-shū, founded by Hōnen (born in 1133), Jōdo-shin-shū, founded by Shinran (1173–1262), Ji-shū founded by Ippen (1239–89), and Nichiren-shū founded by Nichiren (1222–82). The power exerted over the people of Japan today by Buddhism is considerably weaker than that historically exercised by the various sects and branches of Christianity over the West. Nonetheless, throughout its long history in Japan, even though it produced many different schools, Buddhism has provided a consistent, profound spiritual and philosophical basis to Japanese culture. It is impossible to discuss the essence of Japanese architecture, music, drama, painting, or literature without referring to Buddhist philosophy. Although Buddhist influences are seen in tangible form in such things as wooden temple architecture, its deepest penetration is into the effects and methods of spatial composition and into ways of establishing relations between nature and architecture and between technology and humanity.

The second of my characteristics of Japanese society – mobility – and fourth – extensive use of wood – are closely related to Buddhist philosophy. The 'Diamond Sutra' (*Kongō-kyō* in Japanese, *Vajra-sūtra* in Sanskrit), a most important Buddhist classic, sets forth the nature of wisdom and of *śūnyatā*. (*Śūnyatā* – *ku* in Japanese – is sometimes translated too simply as 'emptiness' or 'nothingness', but its true meaning is a paradox: that emptiness which is substantial existence.) The Diamond Sutra contains an important teaching that the truly non-existent (*shinkū* in Japanese) is the basic meaning of existence and that there is no differentiation between life and death as there are no forms or characteristic essences. This theory is

called *musō* in Japanese and *lakṣaṇa-alakṣaṇatas* in Sanskrit. It means that life and death are one and that human beings should not become too attached to any one idea or place but should always remain aware of being in eternal time. According to this philosophy, the total greater life surpasses time and space and life and death to become part of the greater flow of transmigration, which is called *rinne* in Japanese and *samsāra* in Sanskrit.

The differences between the seasons are clearly marked in Japan, instilling in everyday activities and experiences a powerful awareness of the changeableness of life. The people of Japan also live with the threat of earthquake, flood, typhoon, and other natural disasters. Since forests cover much of the land, the Japanese have long used wood to make their architecture, their bridges, ships. Wood – and therefore the buildings, bridges, ships, and cities made of it – is liable to be destroyed by natural deterioration. Because of the great extent to which the Japanese have used wood over the centuries, they are accustomed to this kind of gradual destruction. Possibly for this reason it was easy for the Buddhist concept of *samsāra* and the idea that essential emptiness (*śūnyatā*) is true existence to take deep spiritual root in Japanese culture.

In recent years awareness that the limitations to the natural resources of the world and that human society and all of its environment are one in a great life system has become widespread. But to Buddhism this is nothing new: it is a basic tenet of the concept of *samsāra*. The acknowledgement by the Metabolist group in its 1960 book that society is part of a greater circle of life coincides with this doctrine. The principle that architecture should change with time, the principle of replaceability and interchangeability, and the principle of the metabolic cycle, as well as the belief that architecture, cities and humanity itself are ephemeral, are all in accord with the doctrines of *samsāra* and *lakṣaṇa-alakṣaṇatas*.

The thought of Metabolism is theoretical and philosophical. We do not intend to create forms or styles, because these are only the provisional manifestation of thoughts. Forms and styles occur in consequence of historical, temporal, spatial, material, geographical, social, and sometimes purely personal conditions. Philosophy and thought, however, are transmitted in intangible ways.

The notions of in-between space and *en-space* have persisted in my works from the architecture-of-the-street philosophy of the Nishijin Labour Centre of 1962, through the main office of the Fukuoka Bank (1975) and to the Tokyo building of the Daido Insurance Company (started in 1975).

Individualism, developed as a fundamental condition in the modern society of the West, is not found in the historical spiritual make-up of Buddhist culture. As I have explained, a tendency to concentrate and centralize authority and to produce a society that is basically homogeneous characterizes the history of Japan. This has meant that guarding the responsibilities and duties of the individual and attempting to advance individual interests have not been features of the Japanese national character. This in turn has developed a characteristic tendency for the Japanese to act in groups and to be, to use David Riesman's term, other-directed. He points out that in Western society today the individual in the organization drifts towards self-direction in his or her action pattern. But because the philosophy of *samsāra* does not recognize the existence of the individual as it is held in the West, the non-individualistic conditions prevailing in Japan have led to lack of democracy in the basic, classical

sense and to a different concept of communal responsibility. It is for this reason that I feel it is important to discover the *jiga* (the oriental individuum).

The oriental individuum is not the independent individual of the West. Oriental thought does not find the basis of existence of the self in the self but seeks the true existence in a supra-individual that transcends the individual. The contradiction of the individual and the supra-individual remains unresolved, but the two preserve their oneness. In the Sanskrit version (Max Müller, 1881) of the 'Diamond Sutra' this passage occurs

*Ya eva subhūte, Prajñāpāramitā
Tathāgatena bhāsitā sā eva apāramitā
Tathāgatena bhāsitā
Tena ucyate Prajñāpāramitā iti.*

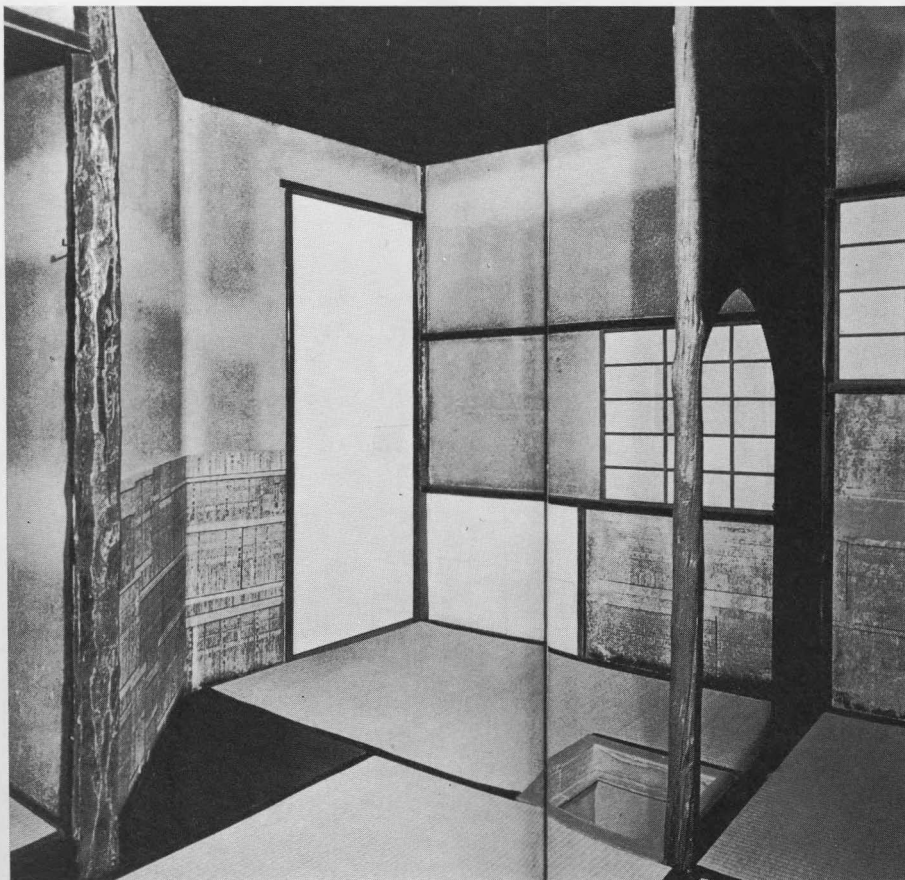
When the purely ornamental words are omitted from the text, what remains is *A eva a-A Tena ucyate A iti*. This means *A* is non-*A*, therefore it is called *A*. This simultaneous affirmation and negation is the basis of the theory of identity and differences, or *sokuhi* in Japanese (*soku* means non-diversity and *hi* means non-identity).

The individual does not exist as part of the organization called society, and neither does the total exist for the individual part. The *jiga*, or oriental individuum, consists of a relationship in which the individual and society, while being contradictory, include each other.

The tea room for the tea ceremony shows how the concept of the individuum is applied to building. The space itself is minimal (about two or three metres by four metres). In it the participants perform a ritual of preparing and drinking tea which is a kind of spiritual exercise. But from within the tiny room they can enjoy sensing the vastness of all nature. In the tea ceremony awareness of nature teaches the participants that the scale of their surroundings bears no relation to the scope of spiritual activity. The greater—the world of nature—coexists with the lesser—the tea house—neither comprehending nor excluding the other yet each an essential part of the other.

I intended my capsule spaces to be a declaration of war in support of the restoration of the oriental individuum, which has been lost in the process of modernization (*Capsule Declaration*, 1969). It is once again necessary to reject the mystification implanted in such ideas as abstracted universal space. By examining spaces for individuals we must seek new relations between the individual and society. The capsule space, which is a representation of the oriental individuum, is not a part of the piece of architecture to which it is attached. The capsule and the building exist in contradiction yet mutually include each other. Architecture that is a representation of the oriental individuum would not be a part of the city. Such architecture and cities would exist in contradiction but would mutually include another. The same kind of relation should exist between architecture and nature and between human beings and technology. The philosophy of in-between spaces and *en*-spaces should help make possible a change of direction towards attaining such relations.

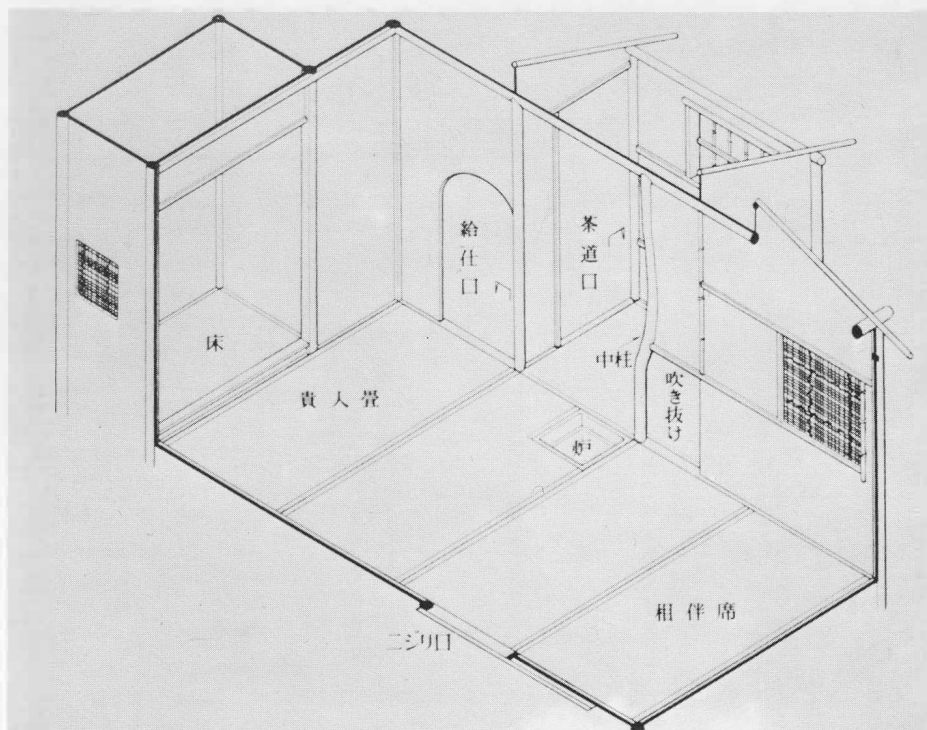
A key feature of this is the oriental street, which is different from its Western counterpart in that it does not establish clear boundaries between different city zones, and because it is a multivalent space where many



(6) Interior of Tea Ceremony House, 'Joan'



(7) Tea Ceremony House 'Joan'



(8) Isometric of Tea Ceremony House

functions are performed, giving it a nature between public and private. A street will be the scene of such intimate family occasions as dining or playing. In festival the partitions will be removed from the fronts of houses to make the interiors public. The open corridors and covered corridors of traditional Japanese architecture act to establish continuity between nature and architecture and link together different architectural groups.

(9) Calligraphy



Its linking character relates *en*-space to the Japanese concept of *ma*. *Ma* has various meanings, amongst them timing, silence, buffer zone, boundary zone and void. In addition, it carries the same connotations as *en*-space, or in-between space. In the Noh drama, when an expression of tragedy or grief is suddenly changed to one of joy, there is a moment of immobility in which change is indicated, that moment too is known as *ma*. Or, in the case of oriental music, such as the *Gagaku*, the ancient court music of Japan, silent intervals provide the necessary adjustment which makes it possible to have a series of discordant sounds. And when Japanese people sing traditional popular songs (*enka*), they hum or lengthen a sound by one bar to provide the step from one sound to another. It is *en*-space or *ma* which gives oriental calligraphy and painting much of its character. In the monochrome ink painting technique introduced to Japan from China long ago areas are left untouched on the paper or silk to make an interval of no-statement, and as such stimulate the imagination of the beholder all the more. In all of these instances the silence or space is the Buddhist *kū* (*śūnyatā*). The same thing applies to calligraphy. The written ideograph is itself real, but it is the spatial proportion and balance of single ideographs or groups of them that give the ideograph power.



(10) *Engawa* (*En-space*) of
Katsura Imperial Palace

Thus, the philosophy of *en-space*, nurtured and developed in all of the fine arts, in the performing arts, the tea ceremony, flower arranging, and also architecture and city planning, is well established in Japanese society. It is also thought to be effective as a philosophy for today, as it enables the peaceful coexistence of the individual and the whole, or of contradictory elements.

The time has come for a re-examination of the role of the individual in society together with the role of architecture in the city. In this



(11) Traditional Noh play

connection, the conception of the individual as explained in Buddhist teachings and in the in-between theory as found in the idea of identity and non-identity (*sokuhi*) should be of great value.

I have explained the theory of Metabolism against the background of five characteristics of Japanese society. I hope that the Metabolist theory will give new meaning to the architecture of today, but I do not intend to try to produce an international style. Nor do I hope to establish standards that can be used everywhere. On the contrary, I believe that it is the historical characteristics of each people, nation, and region which through their own uniqueness are of international significance.

2 The Origin and History of the Metabolist Movement

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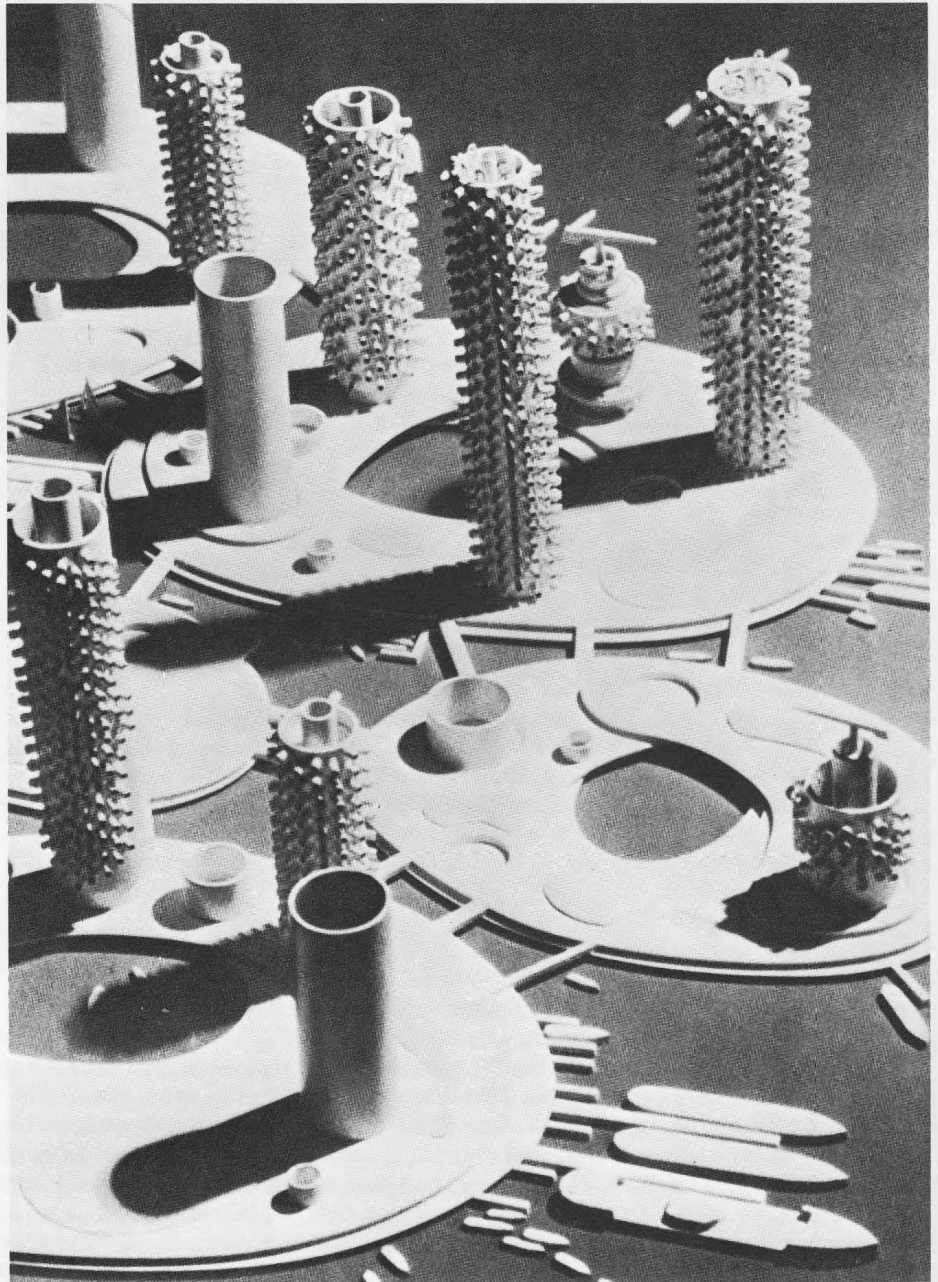
As discussed in the previous section the origin of the Metabolist movement lies in the World Design Conference in Tokyo in 1960. Preparations for the conference got under way in 1959 and went into full swing in the next year, when a 'Theme Committee' was established to study discussion topics, under the leadership of Secretary General Takashi Asada. It included avant-garde architects, and graphic and industrial designers, along with promising pioneers in the fields of crafts, textile and interior design, city planning, education, and criticism. Taking a leading role in the committee were the architectural critic Noboru Kawazoe, architects Masato Otaka, Kiyonori Kikutake, and myself, industrial designer Kenji Ekuan and graphic designer Kiyoshi Awazu. These committee members later formed the Metabolist group.

Kikutake had stepped into the limelight by publishing his theories about 'Marine City' and 'Cell City' in *Kokusai Kenchiku*, a Japanese architectural magazine, in early 1959, and Otaka was preparing to leave Kunio Maekawa's architectural office to become independent. I was also preparing to leave Kenzo Tange's research group at Tokyo University. Kawazoe had resigned as the editor of the *Shinkenchiku* (*Japan Architect*), a leading Japanese architectural magazine, and had begun brisk activity as an architectural critic, paying attention to the new ideas of the younger generation.

Towards the end of 1959 Kawazoe, Kikutake and I met frequently and confirmed that there was common ground in our thinking. We looked for a word to embody these common points, and finally agreed that 'metabolism' was the most appropriate. Convinced that 'metabolism' is the concept for the modern age, we decided to find others who agreed with our ideas in order to spread the idea through a campaign.

At this time Otaka was drafting a plan for developing Shinjuku as a new business centre for Tokyo. He was working in cooperation with Fumihiko Maki, who was then active as associate professor of the Washington University in St Louis, Missouri. Their theme was 'group form'. Otaka and Maki joined us, seeing the 'group form' concept as a facet of 'metabolism'. About the same time, in 1959, Tange represented Japan at the CIAM-Team 10 Conference. He returned with the news that CIAM had been dissolved and reported on Team 10 activities. In addition, we obtained information on some of the activities of the GEAM centred around Yona Friedman.

In light of this we decided to publish a manifesto before the opening of the World Design Conference to clarify common points and differences between our thinking and the concepts on which the foreign activities were based. With only a few months left until the opening of the conference we held meetings almost every day and compiled *Metabolism 1960 – the Proposals for New Urbanism*, a report consisting mainly of plans and projects of the individual members of our group.



(1) Marine City by K.
Kikutake

In the first chapter of the book, 'Ocean City', Kikutake presented his proposed 'Tower Shaped City', and 'Marine City', which developed from his basic concept of 'unabara', according to which he planned a new city metabolism developing through the three stages of 'movable equipment', 'movable house' and 'mova-block' (movable city). 'Towards Group Form' by Otaka describes a 'Group Form' system evolved in connection with his re-development programme for Shinjuku, which involved using the site of a

former water treatment plant. My contribution 'Space City' with plans for 'Agricultural City' and new plans for Tokyo, proposes development of infrastructures in cities and tries to clarify the relation between changeable and unchangeable elements in city space.

However, the plans proposed in the book are not of the kind that can be easily implemented in their entirety, nor are they backed up by detailed technical schemes. But we do not regard ourselves as Utopians. Then, how do they differ from Utopian ideas?

Growth and transformation are taking place at an ever-faster pace in modern cities. From the Industrial Revolution until the middle of the twentieth century, the growth of a city meant the expansion of its confines until it became a giant, but cities are now about to undergo a metamorphosis entirely different from this pattern. Regardless of whether the city limits its expansion or not, the mobility of people, goods and information is increasing at a drastic pace and the pattern of a living structure is becoming volatile. With closed communities crumbling, the neighbourhood system, which has been a basis of city planning, is now becoming meaningless.

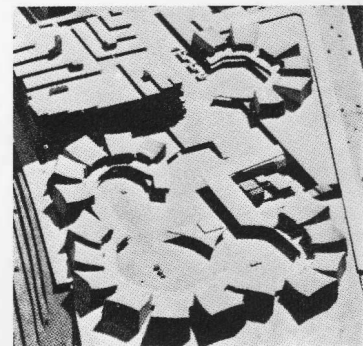
There is no value then in describing detailed plans which can be realized with available technology when cities are changing so quickly. Our plans served to explain how cities should exist, even though they entail visions which cannot be turned into realities at present. Our models were not ideal images abstracted from some notion of a universal city, but rather were meant to expose clearly the contradictions facing cities since the group had been more concerned in incorporating its ideas into concrete works. It was intended that the *Metabolism 1960* manifesto be followed up with volumes on methodology and execution.

As the year turned we started work on the publication of *Metabolism 1961*. New members joined in the form of industrial designer Kenji Ekuan (President of G.K. Industrial Design Institute), city planning expert Takashi Asada (who served as Secretary General of the World Design Conference Tokyo, 1960), graphic designer Kiyoshi Awazu, painter Hiroshi Manabe and photographer Shomei Tomatsu.

A series of heated editorial meetings was held. About this time Tange, who supported the group, was contemplating a new city idea, which was published under the title of 'A plan for Tokyo 1960 - Towards a structural reorganization' in the January 1961 issue of *Japan Architect*. In those days Japan had begun its climb in economic prosperity and there was brisk activity in construction investment. For the first time the government announced a long-range economic programme, under the title of 'Income-Doubling Plan'. Against this general background Tange's 'A plan for Tokyo, 1960' and the activities of the Metabolist group attracted a great deal of attention not only in architectural circles but amongst those interested in social development.

Chaotic conditions, in Tokyo, Osaka, Nagoya and other major Japanese cities were becoming even worse, and new construction would start without foresight or vision. City planning projects from public offices were just as bad. Opinions differed within the group on how to respond to these social circumstances and as a result publication of the new manifesto was postponed a year. We held further discussions and planned every year to bring out the projected publication, but it never appeared.

We developed closer contacts with foreign architects year by year. The World Design Conference in Tokyo was attended by Peter and Alison

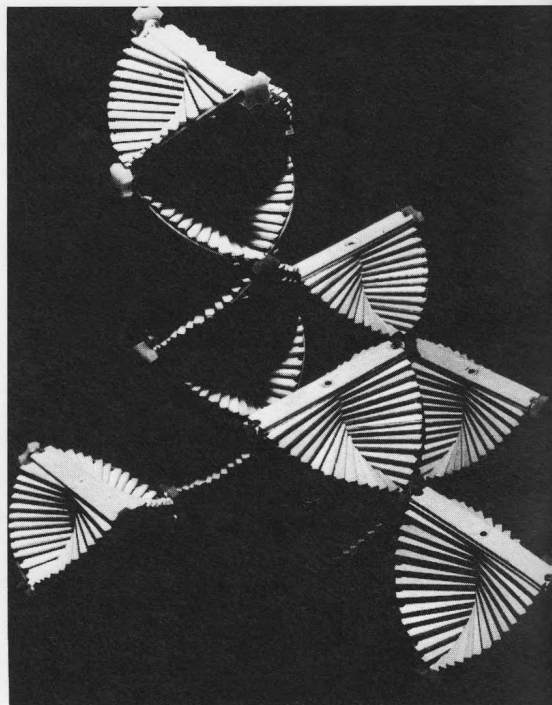


(2) Shinjuku Project by
F. Maki and M. Otaka



(3) A plan for Tokyo by Kenzo Tange

(4) Helix City, 1961, by K. Kurokawa



Smithson of Britain, Louis Kahn of the United States and Jean Prouvé of France. In return Maki took part in the 1960 Team 10 meeting in Europe. I attended the 1962 Team 10 meeting in Royaumont, France, and, later, the 1966 Team 10 Meeting in Urbino, Italy

Meanwhile, members of the group engaged in an increasing number of practical undertakings, especially, in 1961 and 1962, involving prefabricated houses. In 1960 I wrote 'Prefabricated House' as a technical application of Metabolism and this gave birth to my idea of 'capsule architecture'. At that time all the major Japanese building firms were showing interest in mass production of houses, and Otaka, Kikutake and I acted as technical consultants to the Nippon Prefabrication Co. At the company's request we worked for the technical evolution of Metabolism in a way which combined with the industrialization of house construction. Otaka worked on a method of building prefabricated houses, utilizing light gauge steel units, while Kikutake studied a renewal method for equipment units. I did research on a new building device for 'medium-high' prefabricated apartment houses based on box-type concrete units. Although these studies were not put to practical use, they had an impact on architectural circles as concrete expressions of the Metabolist theory.

The group worked on more and more practical schemes. These included Otaka's Sakaide artificial land plan and my work for the Nishijin Labour Centre in Kyoto. This practical work made us more aware of both the possibilities and contradictions in our methodology.

In the early sixties plans and concrete works incorporating Metabolist concepts began to appear in other architectural circles, such as the Kojimachi project by Sachio Otani, the Yamanashi Culture Centre plan by Kenzo Tange and the Oita Public Library by Arata Isozaki. In 1962

preparations were made for formation of a Team Tokyo comprising the Metabolist group and Kenzo Tange, Takamasa Yoshizaka, Yoshinobu Ashihara, Koji Kamiya and Arata Isozaki, but this met only once.

In 1965 the Metabolist group was again launched on full-scale preparations for publication of the projected book, motivated by the discoveries of its limitations which three years' practical application had revealed. The studies published by different members at that time were all methodologies for clarifying the internal organism and mechanism of growing and changing cities or structures. In view of the theory's limitations, misgivings were expressed and debated by the group's members that unless the theory of *metamorphosis* – according to which metabolic processes produced a sudden emergence into a qualitatively different stage – were introduced to the public, it would be impossible to go beyond the methodologies of metabolism.

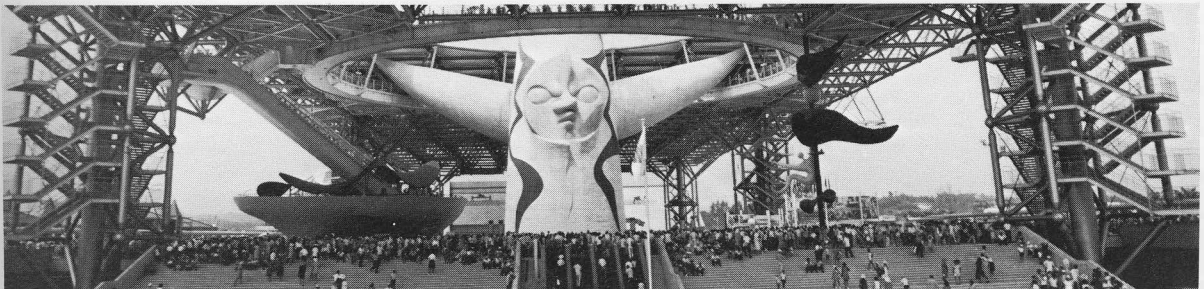
Further plans to publish a book did not materialize because of the growing diversity of opinion among the members of the group. Each member continued his work actively, pursuing his own goal, and many published individual works.

The Osaka Exposition in 1970 provided an opportunity for the group to work jointly again. It was decided that Noboru Kawazoe should undertake the task of producing the Theme Pavilion on the Grand Roof of the Symbol Zone to be designed by Kenzo Tange. I organized a seven architect committee which included members of the group. Masato Otaka and Kiyonori Kikutake cooperated with Kenzo Tange in designing major structures for the Symbol Zone. Kenji Ekuan took part in designing the street furniture and the minirail. Expo '70 provided me with an opportunity to design the Takara Beautillion and the capsule house in the Theme Pavilion, a realization of my Metabolist theory which I had begun to work on in 1959. These were important experiences which led to my designing the Nakagin Capsule Apartments in Tokyo in 1972.

In 1970, the architectural committee invited to Japan architects such as the Archigram Group (Britain), C. Alexander (the United States), Y. Friedman (France), M. Safdie (Canada), G. Carlo de Carlo (Italy) and H. Hollein (Austria). They provided exhibits for the Theme Pavilion on the Grand Roof and attended congresses held in Tokyo and Osaka.

After Expo '70 Kikutake and I were nominated as participating architects in a design competition to be held under the auspices of the United Nations for the construction of low-rise, low-cost housing. Fumihiko Maki joined this design group and the design by the three-member group won the first prize. Subsequently, Kikutake and Maki were entrusted with supervising construction. Since then the group has undertaken no work jointly

(5) Symbol zone of Expo '70 by Kenzo Tange



Agricultural City, 1960

46 A framework is made by making the streets into architecture. Streets are the infrastructure of cities, and housing and public facilities compose the substructures.

The prototype of a city composed not of plazas but only of streets is Kyoto, which has a history stretching back 1,000 years.

In the farm village, land is the means of production. The living space of the Agricultural City is developed on artificial land held above the ground by pillars.

We must break free from the thinking that farm villages and cities are inherently opposed, and create homogeneous living spaces.

(This was prepared at the invitation of the Museum of Modern Art, New York, for its Exhibition of Visionary Architecture, held in 1961. The concepts of making the street as a place for living into architecture and the infrastructure of a city began with this project and later developed into the theory of architecture of the street and, more recently, the theories of semi-public space and en-space.)

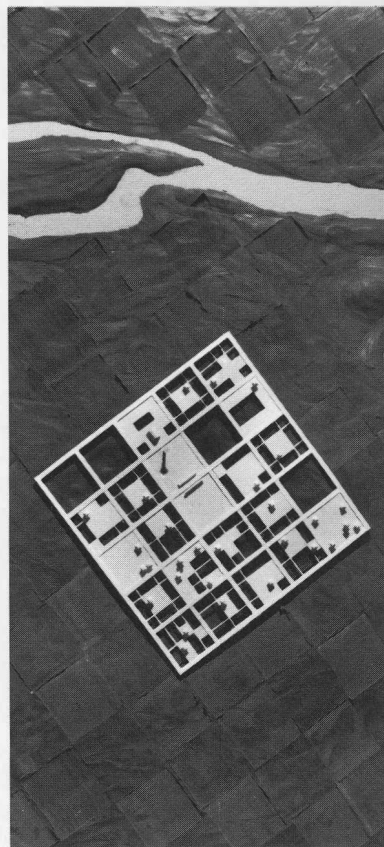
Planification

One is accustomed to thinking of city v country when speaking of 'the farmers' exodus to the city', or 'the dispersal of urban populations'

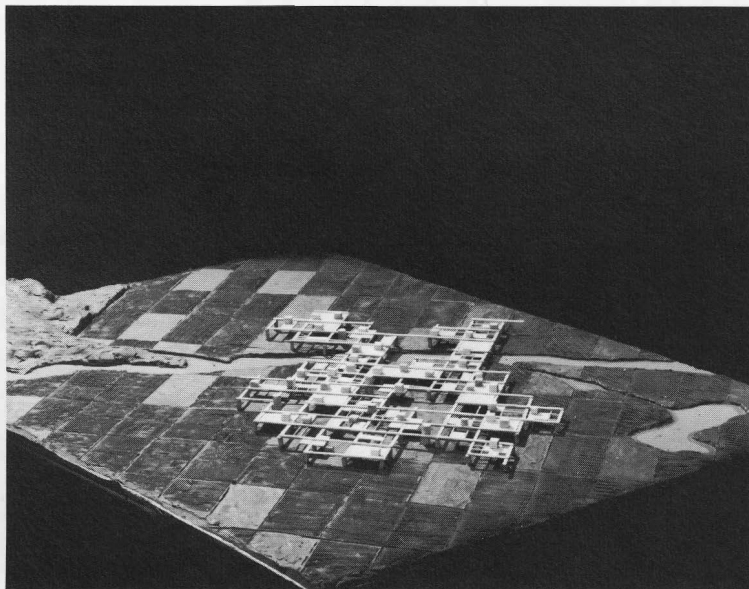
Just as other working communities such as the industrial and commercial are located in and around the cities so the agricultural community should be located in compact and well-planned suburban areas so as to form ties with the urban area, and because these suburban areas may, in the future, be cities themselves.

The idea presented is a proposal by Kisho Kurokawa for the reconstruction of the agricultural towns in Aichi which were destroyed by the Ise Bay Typhoon of 1959. The majority of the flooded towns were located in very compact areas so Kurokawa has proposed units of 300 by 500 metres organized around a temple or a grade school, and located on artificial 'soil' over pilotis, off the ground, where all the installations and circulations meet. This level also contains the service area. The earth is then free for agricultural use while the private dwellings are above the installations so as to protect them from floods.

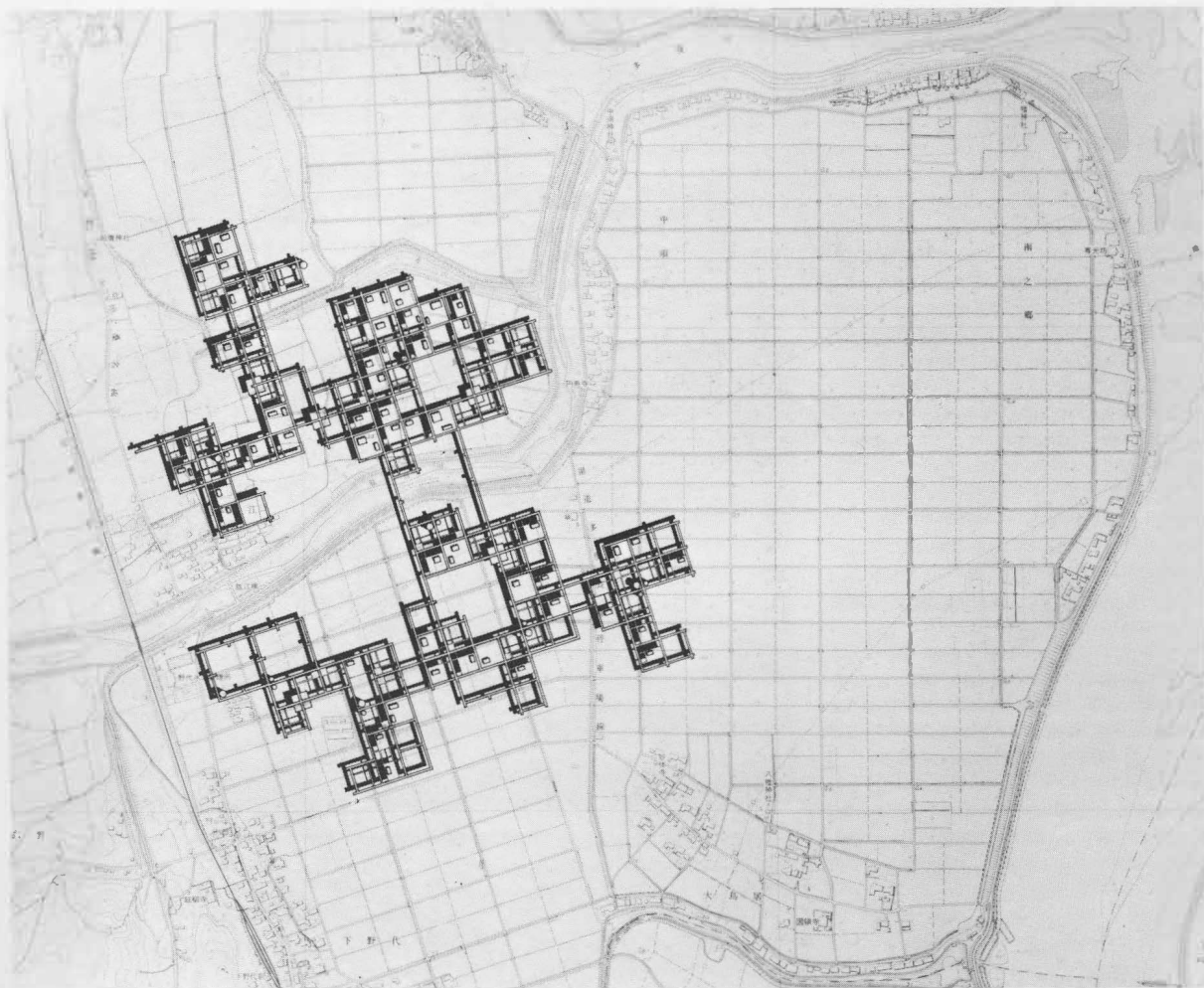
(Arquitectos de Mexico, May 1966)



Model, second version, aerial view

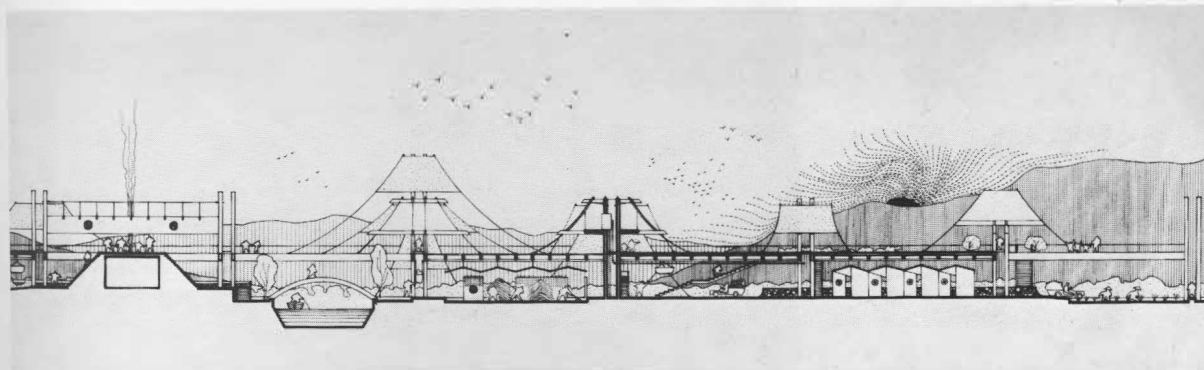


Model, first version, aerial view



Plan, first version

Section



Museum for Kumamoto City, 1975

48 This museum was planned as part of the Third Ring, or samurai quarters, surrounding Kumamoto Castle. One of Japan's better-known castles, it was built by Kato Kiyomasa in 1590–1600. One of the keeps of this castle, the Udayogura, is particularly beautiful, with an intricate pattern of straight-line gable roofs.

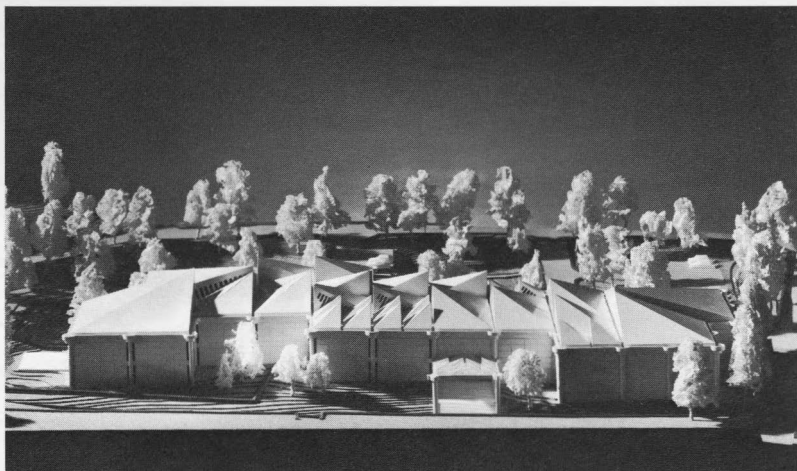
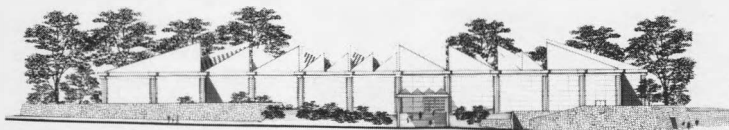
The three-sided natural-lighting roof of the museum is intended as a metaphor of the Udayogura and also as a metaphor for dialogue between the unit spaces that make up the building.

The positioning of the *gangyō* (geese-in-flight array) and the irregular three-sided roof imparts complexity to the volume of architectural space and easily relates to nature. The complexity of the configuration of light and shadow in the architectural space also facilitates growth (expansion).

Gangyō is a traditional form of obtaining continuity through a pattern of light and shadow. It may be seen at the Katsura Palace and in the walls of many Japanese castles.

The structure of the capital of the columns produces nodes formed by the meeting of columns and beams, and expresses an impetus for growth.

(This work is the most recent in the series which began with the Nitto Food Cannery of 1964. It is concerned with composition through unit spaces.)

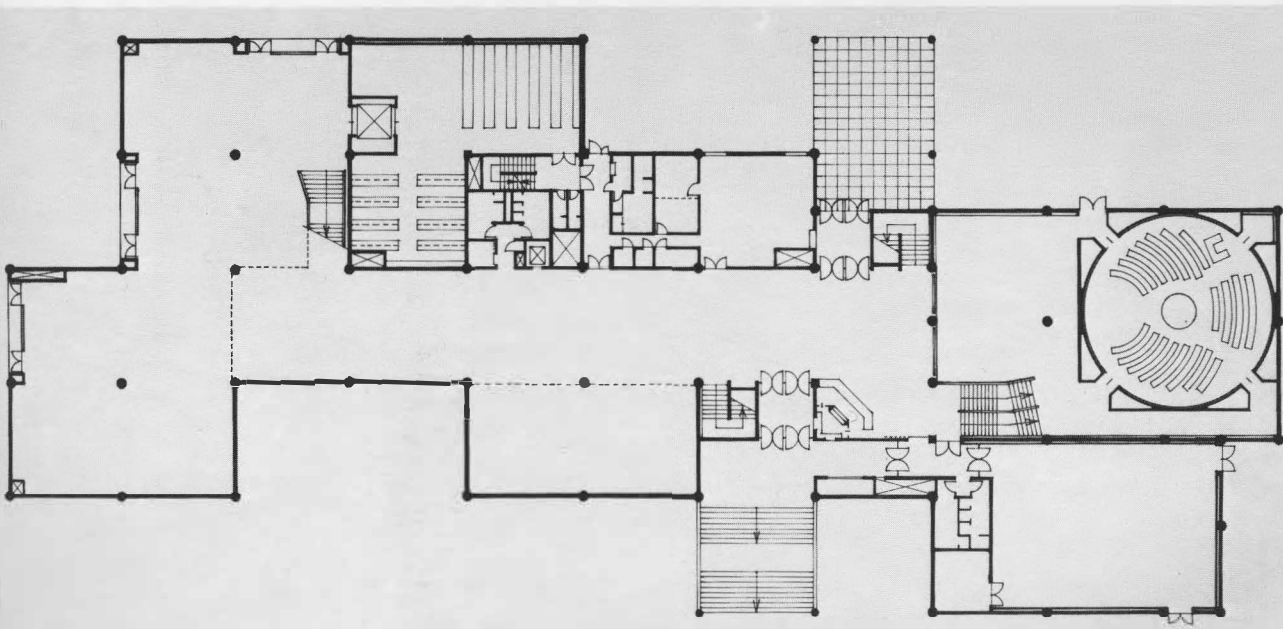


Preliminary sketch

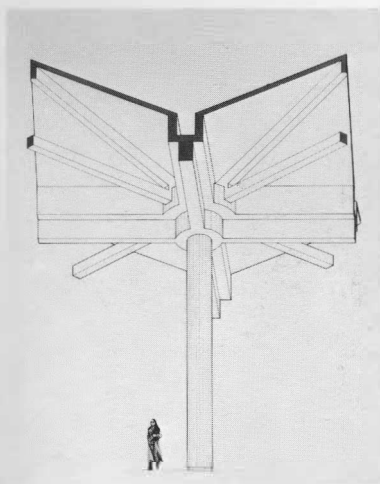
The ancient stone fences have been rebuilt

Model showing elevation from main approach

Model showing lay-out of roofs



Plan of the ground level

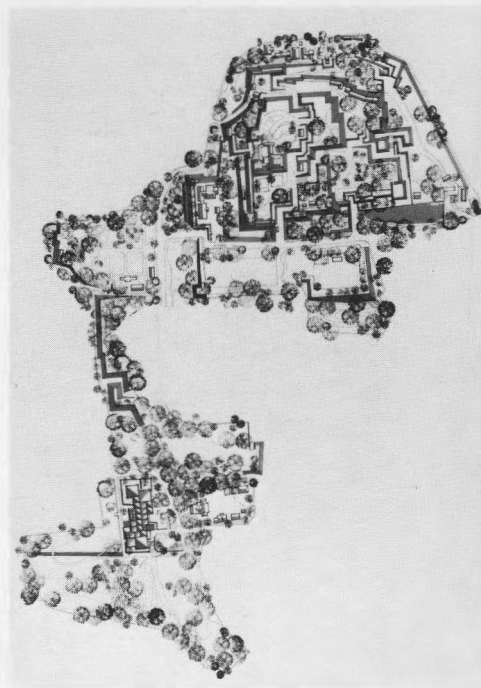


Detail of the capital

The *Udo-yagura* of the castle (1590–1600)



Plan of the Kumamoto Castle and of the museum



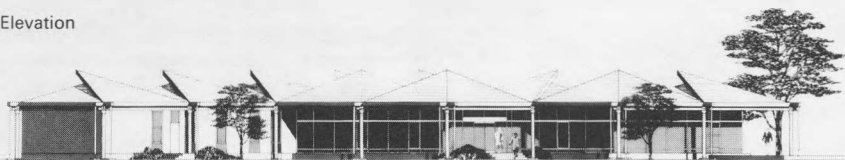
Service Area for the Tokyo–Nagoya Highway, 1969

50 This includes a restaurant, filling station and other facilities for motorists. The same system was applied to several service areas, with the combination of elements in each case determined by the characteristics of the site.

(This is part of the series of works which began with the Nitto Food Cannery and includes as its most recent work the Museum for Kumamoto City, each being designed as an assemblage of units.)

Bird's-eye view

Elevation



Restaurant from parking area





Nitto Food Company Cannery, 1964

52 This is a peach cannery in Sagae city, north-eastern Japan.

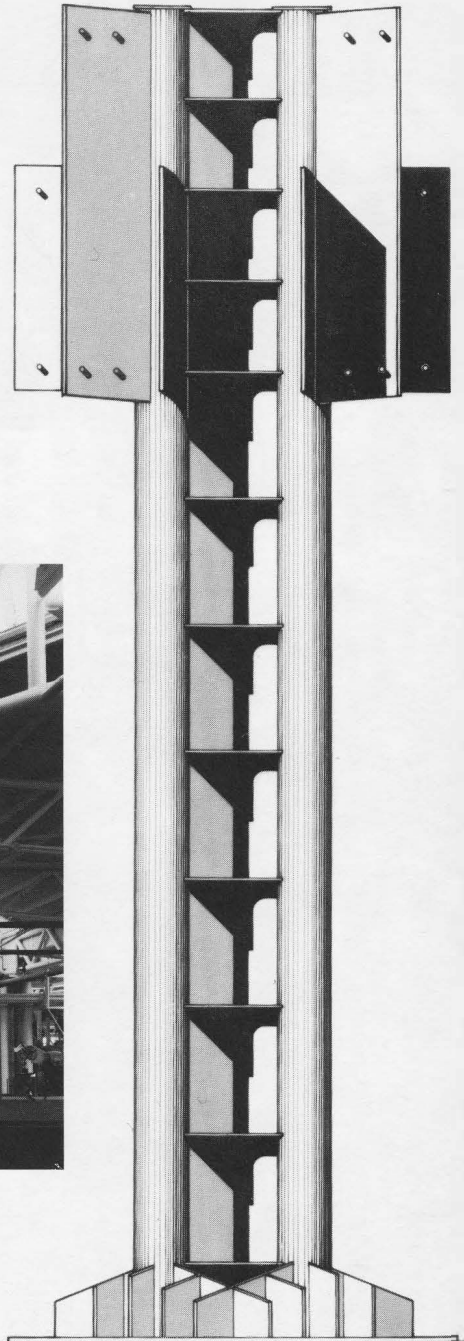
The cubic spatial units were assembled as pipeframe structures off site and built as large a size as possible before being transported by rail from the factory to the site, 700 kilometres away. The main beams of the pipe which comprises a unit of space are placed diagonally and the columns they carry are compound columns of X-section pipes. All systems of growth which compose the architectural space defined by the production lines and production scales are concentrated as nodes at the upper end of the X-section pipes.

The columns are symbols of growth.

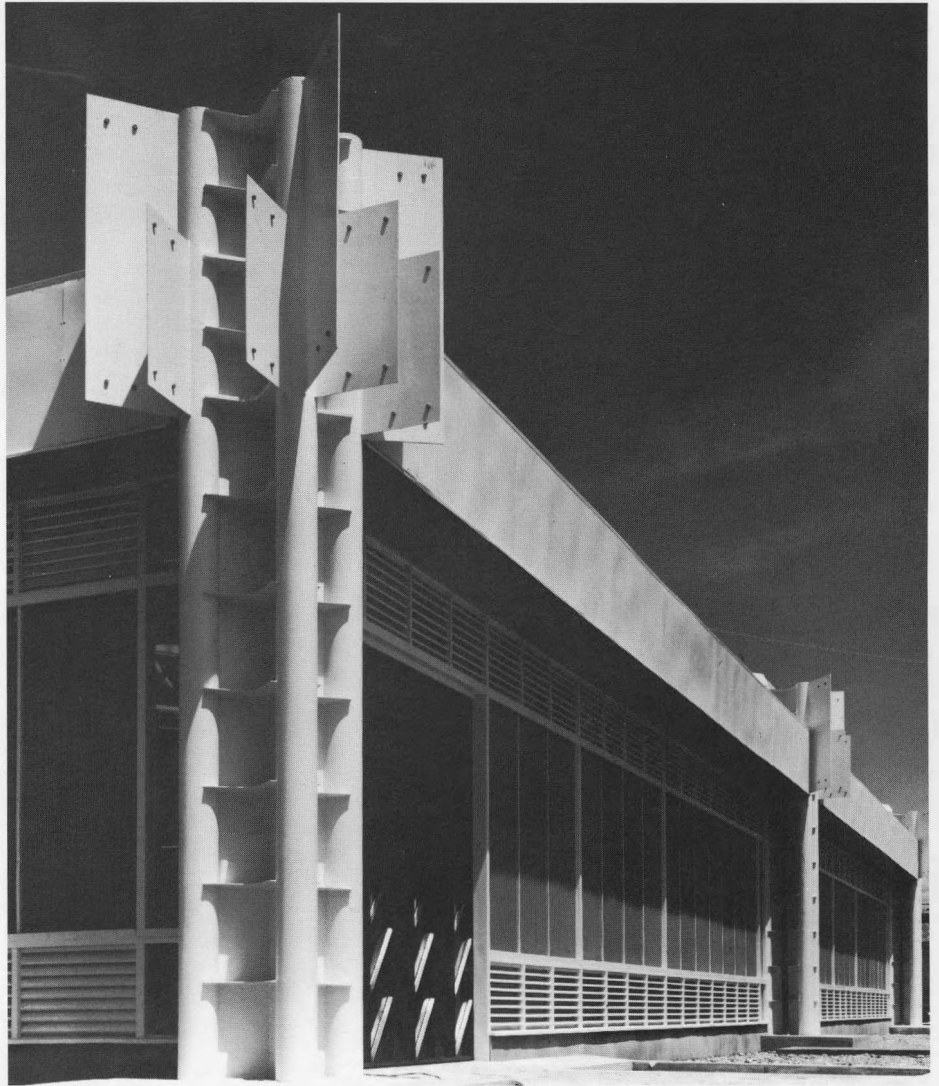
(This work became the prototype of grid plan systems which I used later on.)



Interior of the factory



Column



Joining plates ready for future extension



South elevation. The wall consists of corrugated plastic panels. Service facilities are attached to main structure

Floating City, Kasumigaura, 1961

- 54 This was prepared as a housing project to be built on the surface of a lake, in connection with the plans for the New Tokyo International Airport at Narita.

Vehicular and pedestrian traffic are separated vertically on the roofs of the structures; the motorways and sidewalks form a transport system which connects the structures of the city. A harbour is provided at each unit for use by surface craft. A spiral escalator system provides a vertical transport between the roof-top and lake transport systems.

Each home-owner is free to use whatever building materials he prefers. The homes are built on man-made land, have a spiral configuration and are provided with terraces. It is through the residences

that the city takes on its character.

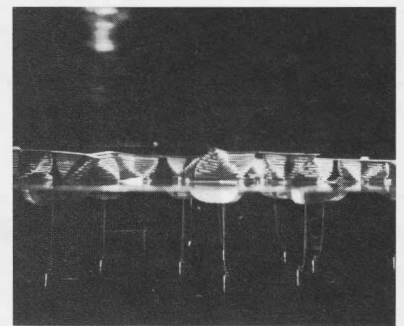
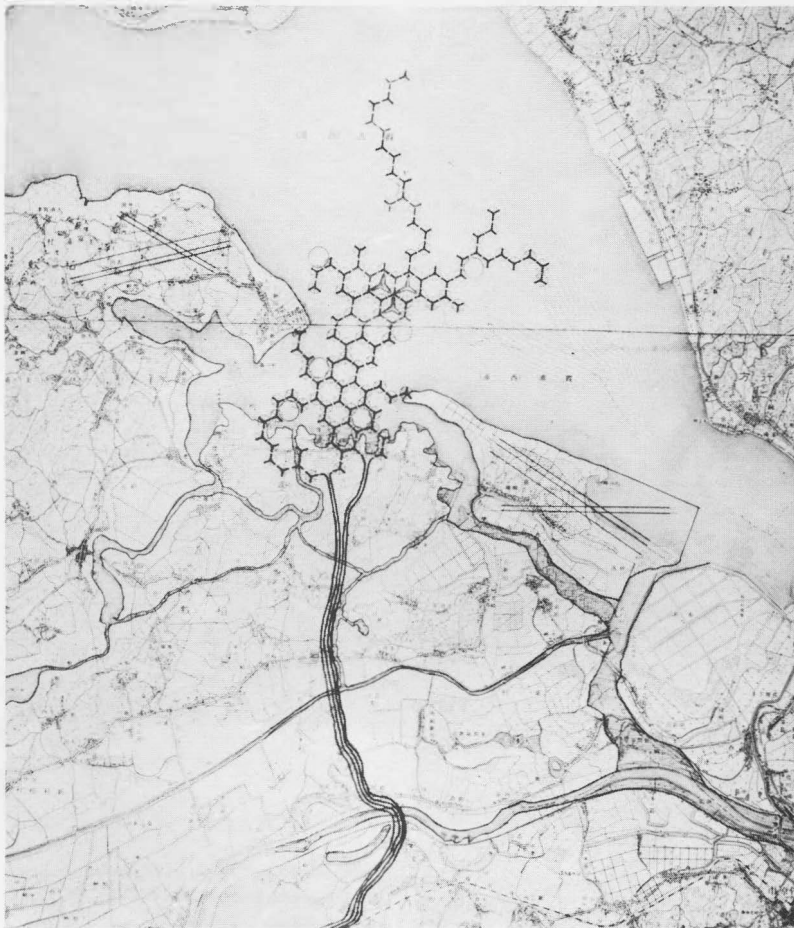
The structure of a city must be a multi-planar transport system centred on the activities of daily life. In particular, in the same way that the helix of chromosomes transmits information, the spiral system will probably bring a third order to urban space.

The unitary-space helix is a prototype of a city with three-dimensional growth potential.

(This was the prototype of the Helix Plan prepared for the second publication of the Metabolist group. The tetraframe of the Toshiba Pavilion at the 1970 World Exposition in Osaka and the space-frame project for the Drive-In Restaurant in 1969 were prepared after making studies of spaceframes formed by helixes.)

Gérald Gassiot-Talabot

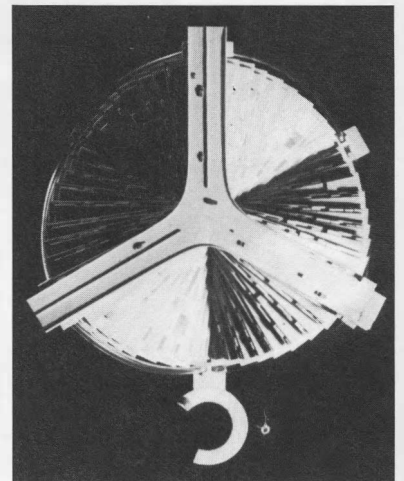
There comes to us from Japan an architect who is twenty-eight years old, gifted with a highly affirmed creative personality and who strongly defends a coherent, original and bold system of urbanism. Kisho Kurokawa belongs to that post-war generation of Japanese architects who, preceded by the wave of men like Sakakura, Maekawa and Kenzo Tange, have magnificently synthesized the Japanese genius and the great lessons of the Western world. Meditating on the tentacular city threatened by suffocation, a young urbanist must above all obviously base his thinking on the categories of exchange and concentration. However, Kurokawa has amplified the suggestive power of these ne-



Model

Plan

Aerial view of model



cessities by interpreting them in an especially prospective spirit. He takes into account the data of the city of the future, the terrific growth of its energetic consummation, and the urbanist's necessity to assure a system of automatic communication, to regulate a life which has become hyper-collective by safeguarding, however, the special needs of the individual, by integrating free space into the organized space of architecture. Nothing, we see, which has not already been envisaged in the most lucid studies of our theoreticians of the city of tomorrow; but Kurokawa, through a movement connected with his youth, places these perspectives in a vital dynamism which is that of the growth of the cities and the development of human activities. Far from inciting him to a disillusioned scepticism or suggesting science fiction views, the threats and difficulties of the world of tomorrow invite him to envisage some solutions which might measure up to an extraordinary future but based on the data of the city of today. These thoughts are based for example on the plans of Tokyo or Kyoto in their present construction to which he applies different solutions adapted to the original siting of the buildings in each of these cities. At Tokyo, for instance, the architect has applied his theory of 'metabolic cycles' to an urban density which demands a complete renovation of the traffic systems. He encloses each quarter with a circular network of thoroughfares suspended to a single direction which spans the surfaces occupied by a huddle of small buildings enclosing the narrow streets and hardly suitable for traffic. By consulting a plan of the urban zone which he planned to redesign in the heart of Tokyo, we have the feeling of a kind of methodical cellular growth around a central nucleus and along seven tentacular axes. This metabolic cycle traced by the peripheral path responds to the reasonable design of a district, to its optimum dimensions for favouring the

fine functioning of exchanges; it makes it possible to standardize the urban problem in small stages by creating each time a kind of enclosed area in which the architect settles his account with the anarchy of constructions without, however, systematically destroying the ancient buildings.

Let us take a closer look. Each of the cycles is connected with its neighbouring ones by a series of connectors which makes it easily possible to pass from one to the other. A network of secondary paths leads to the helical towers which form one of Kurokawa's boldest propositions. These immense cement edifices consist of huge fans on which, on each level, light constructions have been placed living quarters, business buildings, offices. A central channel has allowed for the establishment of all the apparatus of vertical movement, water supply and energy. Every ten levels, connectors link the towers on the same plane and can themselves be joined by secondary axes. Thus a vast complex system of orthogonals and diagonals allows for this volume circulation which is one of the most constant studies of progressive architecture.

If the basic ideas of Kurokawa's action are somewhat 'in the air', his achievements remain entirely personal. It is comforting to observe the formation of this complex living machine which, far from adopting a Western-style geometrical exactness, blossoms forth in the Japanese manner in baroque scrolls, in epic rope-mouldings, in groups which are wanting in foresight for Western eyes. Seen from above, the model of the positioning of these spiral towers includes all kinds of gigantic mushroom affairs whose spores and moss are graciously spread out to the light. The areas for homes and offices open to the sky like immense corolla on which minute grains of human establishment are set. Once the tower is built, it frees the ground occupied by the buildings. Thus with the high stature of these 'door

houses', the city of the future advances, the fantastic army of giants who rake the ancient urban landscape. Finally, we must emphasize that this spiral arrangement constitutes what the architect calls the 'master-system' according to which the development and transformation of the city are empirically carried into effect. This notion is opposed to the 'master plan' or mass plan *a priori* of the town, a Cartesian and authoritarian system which, according to Kurokawa, does not correspond to the natural evolution of things. Le Corbusier's designs in their dogmatic purity do not suit either the Japanese spirit or the urbanistic reality of Tokyo. Realization of this is at least the result of Kurokawa's writings.

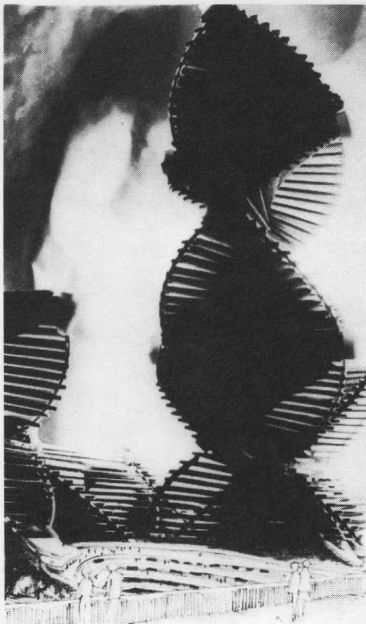
(*Cimaise* November 1962)

Helix Structure, 1961

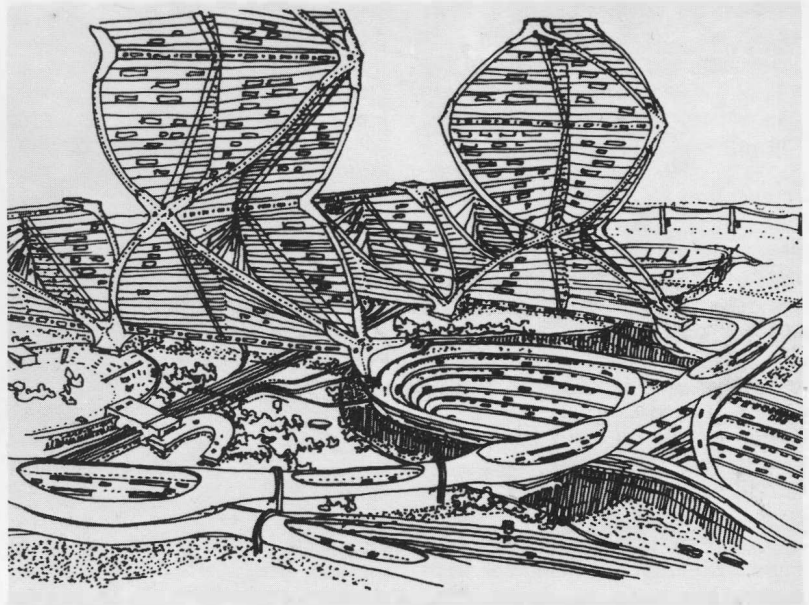
56 At present, urban structures are being developed both vertically and horizontally, and the points of contact are not continuous.

The helix structure is a spiral structure which has been proposed as a third or alternate spatial system. Just as in the case of the chromosomes (DNA) in the life system, the helix structure acts as a space frame for data transmission.

This structure is in the form of a three-dimensional cluster system.

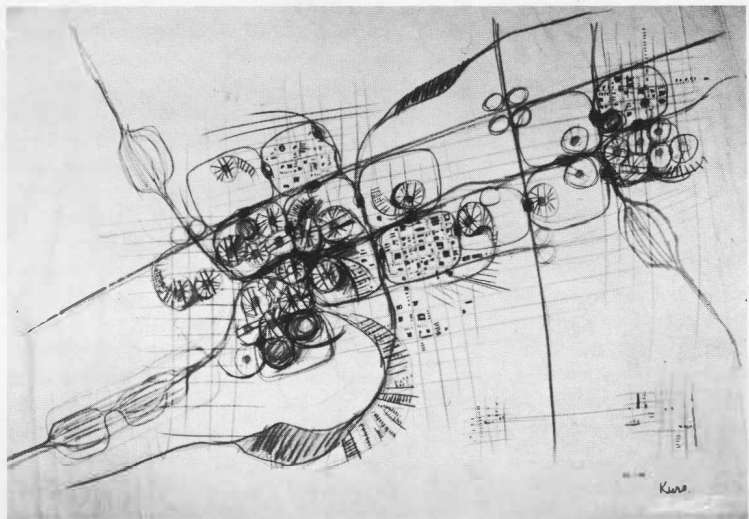


Perspective. Spiral escalators are joined to parking area



Plan. Super-structure for artificial land

Sketch of projected design for central area of city. Helix structure is linked with transportation system of city

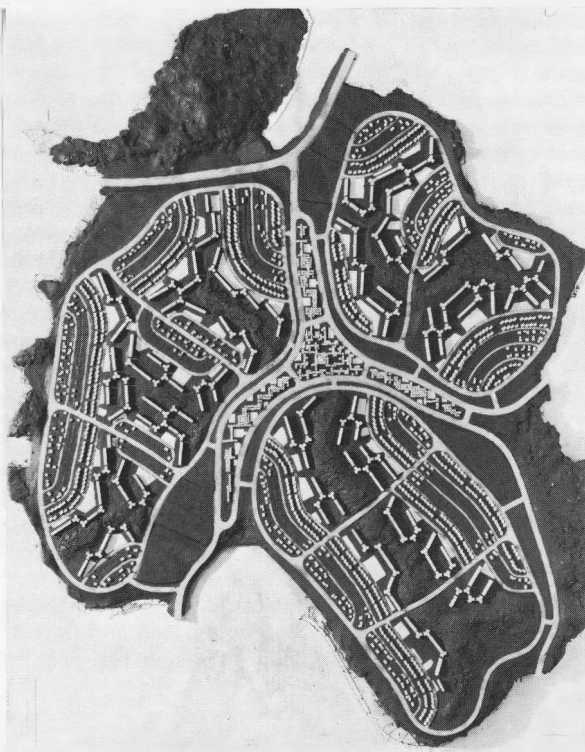


Hishino New Town, 1966

Basic land work is now under way on this application of the metabolist methodology.

The plan employs numerous new techniques including permanent housing units, loop highways, two-stage traffic (T-cross), linear service-zone system, metabolic cycles, joint roads, interiorized nature, and linear growth form placement systems. Three residential districts enclose sections of the line of foothills running across the site. Inside each of the districts is a natural park which utilizes the hills just as they are. Children's parks attach to the natural preserves. In the central area commercial, administrative, welfare, and health facilities are placed in linear arrangements.

(*Japan Architect*, December 1966)
See 'Metapolis - the Hishino Plan'



Model

Aerial view of the site under construction



Linear City 'Metamorphosis', 1965

58 The concentric expansion of large cities has reached the limit of structural growth. Linear cities must be constructed to reform the concentric urban structure with its single-cell-type public and service centres located in the heart of the city.

In the linear city, nature and urban life exist in parallel, there is no city centre and there is considerable growth potential.

(After preparations for the third publication by the Metabolist group on the linear city concept, this concept was first applied in Hishino New Town, Aichi Prefecture, in 1966 and later in Fujisawa New Town in Fujisawa city. Both new towns are currently under construction.)

Cluster from the linear city. Clusters (or cells) are surrounded by service facilities and public facilities

Paolo Riani

Recognizing the fact that the progressive dissociation of the city and the mass of errors that the present forms of development reveal necessitates a total and immediate revision of the system, Kishi Kurokawa has developed a plan with an open system in which the complementarity of the structure lends itself to concrete scientific checks. On the whole his proposals may be considered a worthy contribution and his structures a hope, especially today when the complex of interdependent states and relations goes far beyond the traditional urban limits and demands the immediate establishment of new connections in structure and space. The severe analysis of the reality underlying his proposals never leads him to a disenchanting scepticism but stimulates him to further research and to controls on the operational plane which

are clear and uncompromising. Aware of the paradoxical condition of modern man, who is subjected to the necessities of a collective life but paralyzed by the material impossibility of a real and spiritual communion with the society to which he belongs, Kurokawa proposes a new equilibrium and attempts the difficult feat of reconciling opposites. Emphasizing the importance of communications, he tends to highlight the individual's participation in collective life, the value of which depends more and more on the frequency and the intensity of his relations with others. The emphasis on this aspect contrasts with the relatively static state of order in traditional cities based on a horizontal system of traffic which is now inadequate, and leads him to propose a model based on the density, rapidity and multiplicity of communications, a model which lives

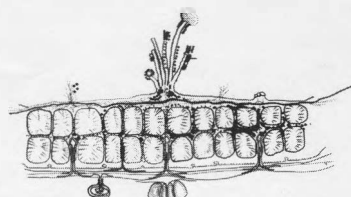


and spreads freely in all directions reclaiming the terrain from nature. In this way Kurokawa seeks to solve the problem of solitude and dissociation which paralyzes man's essence, to solve it in a completely personal style with a 'machine for living' which rises elegantly in a wholly Japanese way and with ample volutes far from the dogmatic purity of Le Corbusier's aesthetics.

But his ideal and experimental models, his images of urban structures, prove to go beyond a tired and academic utopia divorced from the real moment of the complex system of the city, if we consider the coherence with which he applies his philosophy to his projects for the new towns of Isogo and Hishino, or

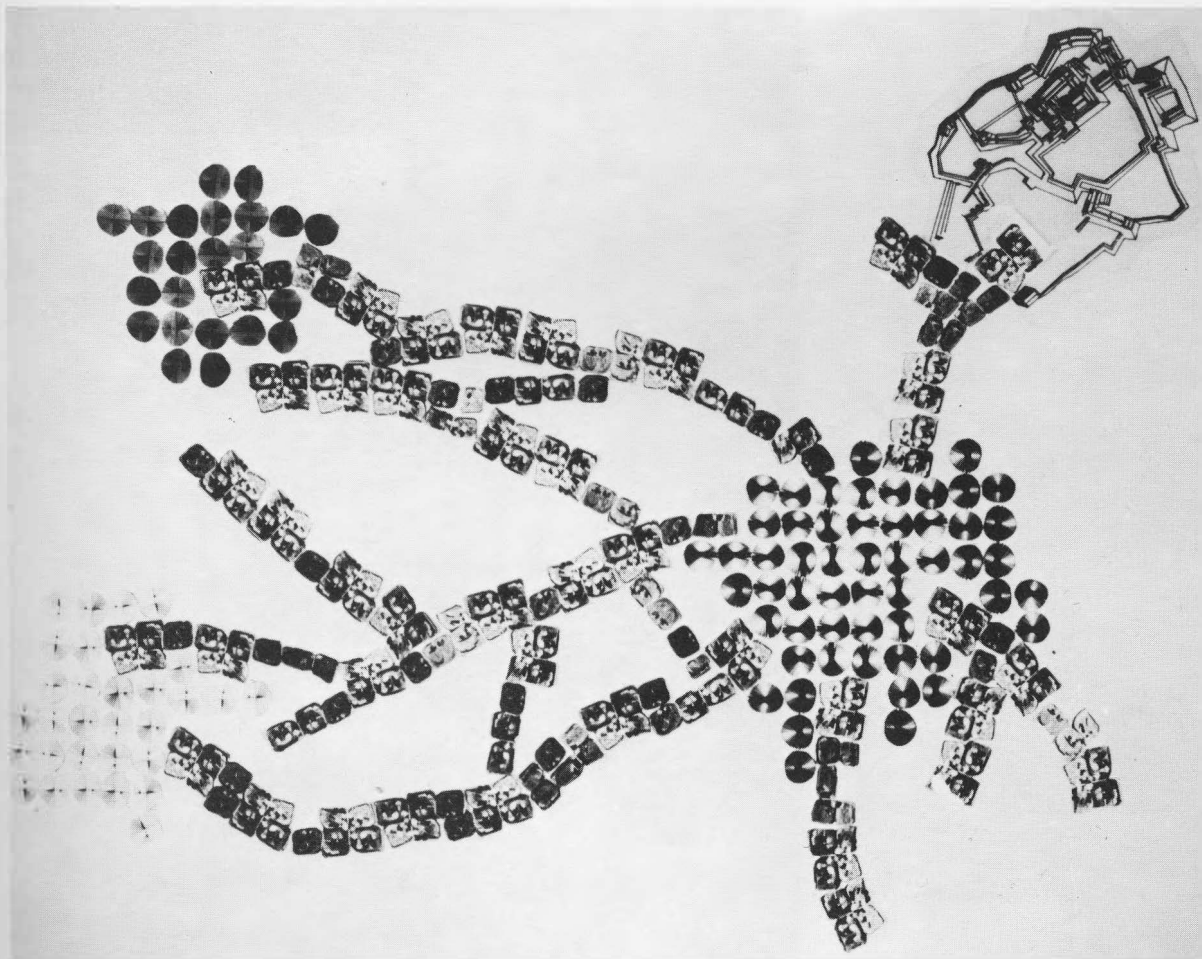
to his lay-outs for free time in the province of Yamagata. Kurokawa is the product of a new school which, even if permeated with militant futurism, has been seriously committed to determining and safeguarding the specific contributions offered by traditional Japanese culture in the progressive levelling-out into a single model of international-type civilization resulting from the rapid industrial and technological progress of the nation. More than anyone else, Kurokawa shows that he has understood that continuity with the past should not be established through images bound to contingent situations, but through methods which can be generalized with critical reflection. This entails

the rejection of a whole repertory of suggestive but culturally dead images, the recovery of ancient values from an inevitable break with the past and their transformation into new forms of sociality. (*Casabella*, 327, August 1968).



Sketch

System of linear city. Modern centre and ancient centre are linked with linear structure



Fujisawa New Town, 1968

60 This new town is planned for a site 30 kilometres from Tokyo. The total area of 350 hectares is divided into sixteen clusters, seven of which are existing agricultural communities to be preserved intact in the new town. None of the present agricultural families will have to move from their homes. The various public service facilities will be constructed linearly in each of the clusters in conformity with the linear city principle. The new town will also include a mono-rail system.

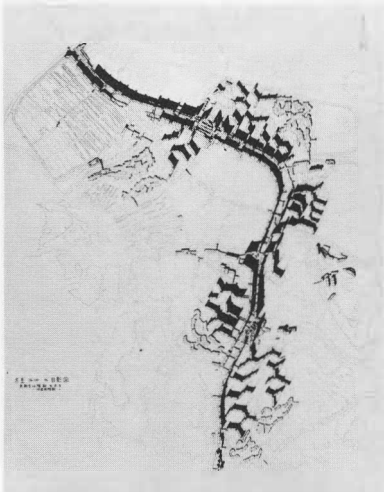
Although the population will be 60,000, this new town will not be self-sufficient. It will be in the form of a network city depending on mutual assistance and connected by bus and monorail with Fujisawa and Atsugi cities.

(Construction was started in 1968 and at present the infrastructure has almost been completed. It was constructed by the Fujisawa City government and the new town will be further developed in conjunction with the private sector.)



Central part of the new town

Layout of housing, based on linear core



Model

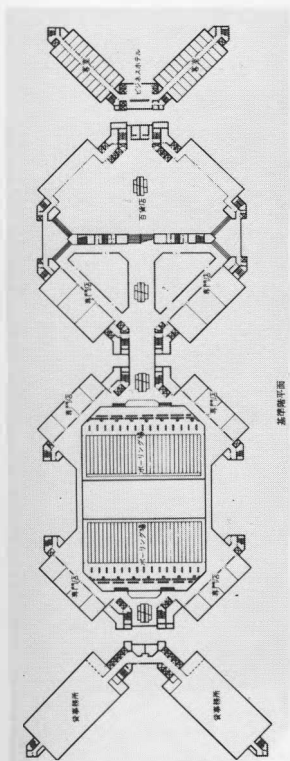
Redevelopment plan for Downtown Kawasaki, 1970

61

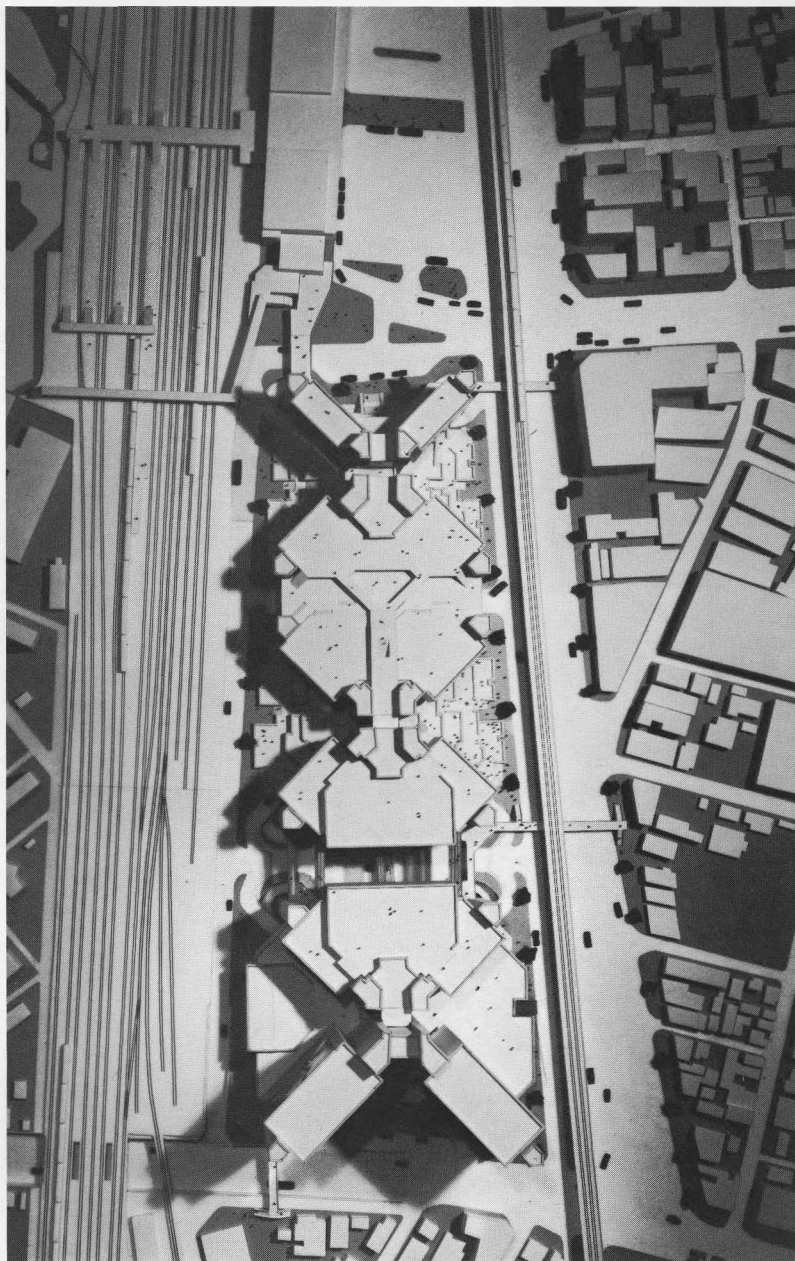
The former site of the Dainichi Nihon Densen plant is being redeveloped as part of the redevelopment plan for the Japanese National Railways Kawasaki Station area. Amenities include hotels, office buildings, department stores, cultural facilities, retail shops, restaurants and bars and a bus terminal. These are to be laid out diagonally so that each is independent but inter-connected by a core shaft for vertical movement.

The lower parts will be in the form of an urban hill with groups of buildings to ensure structural coordination with the immediate environment.

(A group led by Mitsubishi Corporation and including the Kawasaki City Government has been formed to promote this plan.)



Plan of a typical floor



Model

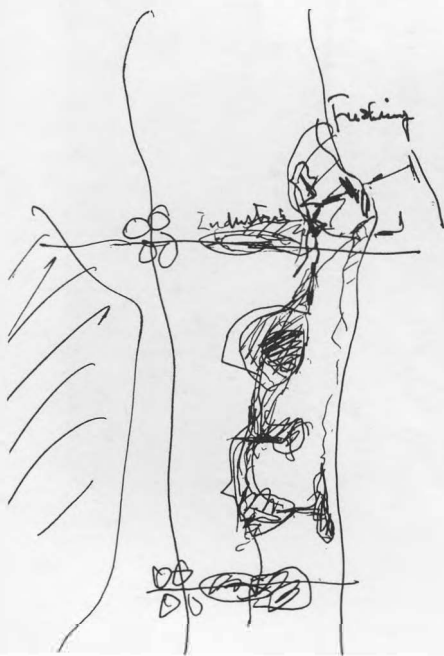
Regional Plan for the Vasto-San Salvo Area, 1975

62 This city plan was produced in accordance with the Piano Regolatore Intercomunale Law. An urban dynamics model was used to provide information on long-term financial planning, investment planning, population estimates, industrial estimates and estimates of changes in ecological systems over the twenty-five year period from 1975 to 2000. Plans were compiled from several alternatives for the use of land so as to provide smooth progress in industrialization with the emphasis on guaranteeing agricultural land and protecting the environment. Structural form regulation standards were also drawn up on the basis of these land utilization plans.

This plan includes new towns to accommodate the expanding population in a compact urban proposal aimed at conserving the historical areas, the scenery and agriculture and preventing sprawl.

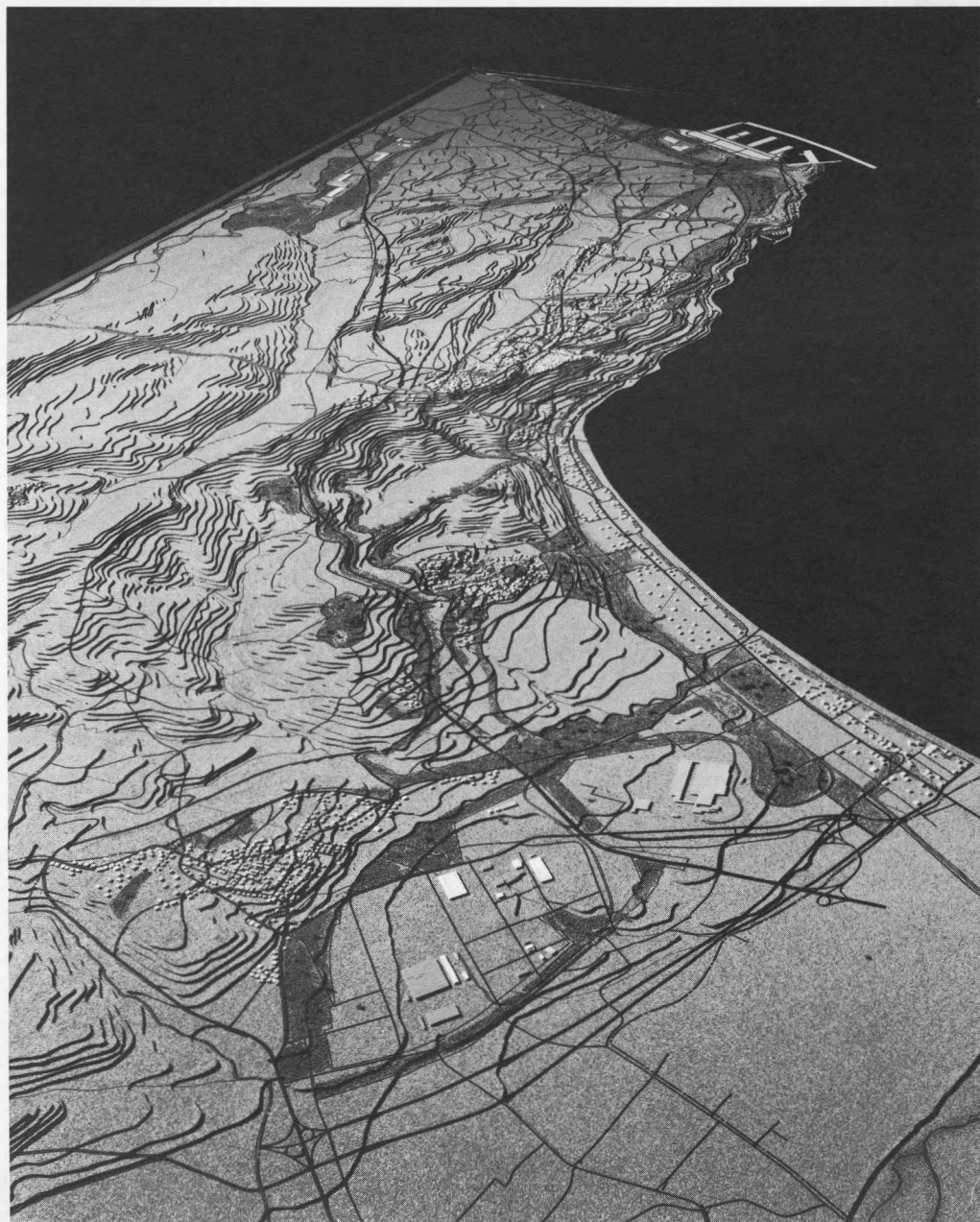
(This design involved team work with research by the Institute for Social Engineering, urban planning by the Urban Design Consultants and the design of the sports centre by Kisho Kurokawa Architect & Associates, all three offices being under the author's direction.)

Sketch



Land use plan

Aerial view of Vasto and San Salvo



The three-dimensional grid in this plan is not only a structure but also an information system. Information-conveying signs are attached to the grid columns and video terminals are provided for an information retrieval system.

The floor slabs of the three-dimensional grid are arranged in the shape of a hill, the 'urban hill'

There is a roof-garden with an artificial stream to give the impression of nature inside the centre.

The main features of the projects were industrialized construction work, a plan which permits growth, optional display areas, an information system, coexistence with nature and coordination with the surroundings.

(This design was submitted in an international design competition in 1971 and received an honourable mention. It is an example of the grid plan developed from the Agricultural City plan of 1960.)

1 Architectural concept (philosophy of the Centre)

The Centre is
a small city within a city (Paris),
architecture of the street,
architecture of the plaza,
where people can pass through
(permeable architecture),
an information centre of culture
of the new age,
a matrix of space (activity) supported by information signs,
an urban connector of different movements,
an urban hill ('new Montmartre').

2. Urban Integration

2.1 Integration into the surrounding area.

The Centre is integrated into the surrounding area by the 'movement pool' where two pedestrian streams from the Metro converge, a water garden from Plateau de la Reynie which penetrates the Centre forming a symbolic gate, the lower roof gardens which relate directly to the preservation areas and the water garden creat-

ing a calm and peaceful environment.

From the north-east point of the site, the Centre opens its arms to the most famous and historical parts of Paris (Arc de Triomphe, Eiffel Tower, Louvre, Île de la Cité).

2.2 Perception of the Centre from its various approaches.

People approaching from the Metro enter into the 'movement pool' which offers a dynamic access to all facilities.

People approaching from Rue Rambuteau and Rue Renard at ground level are led directly to the access area.

People approaching from Plateau de la Reynie are led through the water garden to become integrated into the dynamic urban hill.

2.3 Means of integration into the immediate environment.

The Centre is integrated into the immediate environment by direct connection from the Metro to the 'movement pool' by an underground pedestrian way, bridge from Plateau de la Reynie through the water garden, 'sky escalator' from the water garden to the 'sky restaurant', pedestrian bridge to the old and new surrounding areas.

The matrix structural system of the Centre may be extended to future developments (urban scale).

3. Unity of the Centre

3.1 At the functional level.

The main traffic pattern is through the 'movement pool' from which people are offered a clearly defined way into the various fields of activity. The library, museum and other activities have not been juxtaposed but integrated organically. The experimental gallery, industrial design, open-air theatre and current events are integrated into the traffic stream coming from the 'movement pool' so as to encourage spontaneous activity

In order to utilize effectively the information system within the Centre, an information network, formed of information signs ('information trees'), disseminates information to everyone throughout the Centre. Technical and control areas are placed at the heart of the Centre, to provide most effective control and servicing.

Considering that the ground level approach and the underground approach from the Metro are the two main approaches, a large part of the museum and the theatre group are placed below ground in order to integrate the traffic patterns into the whole of the Centre.

3.2 At the architectural level.

For the structure a waffle grid spanning 27.5 m was chosen as only this scale of structure can create the dynamic space which corresponds to the large city scale.

By stepping back the whole building we create an 'urban hill' in the townscape.

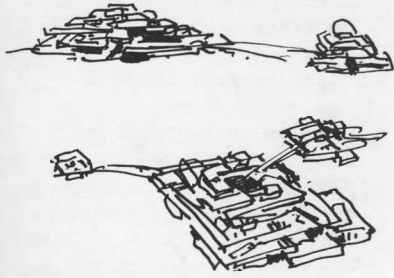
The 'movement pool', the access area and the space between create a new three-dimensional city plaza in which all activities are architecturally integrated.

At night interior lighting turns the Centre into a 'hill of light'. During the day the roof garden forms a 'hill of green'.

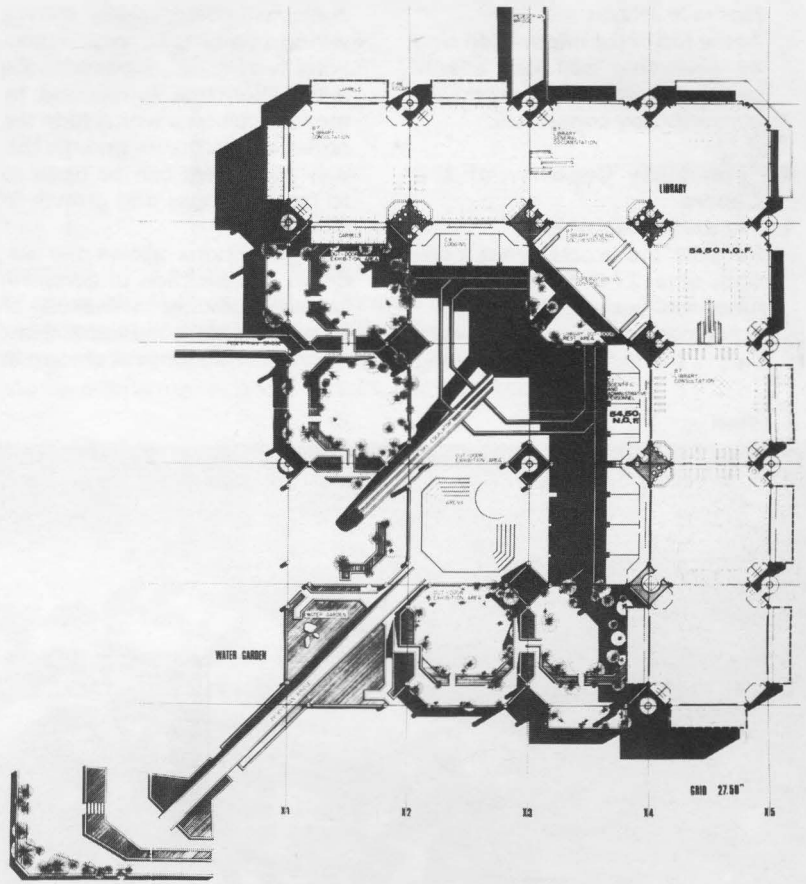
Watercourses from the lower parts of the roof garden spill into the pond at the foot of the hill.

From the water garden people reach the 'sky restaurant' on top of the hill by 'sky escalator' which at night crosses the sky as a 'beam of light' creating a new sign of light for a night in Paris.

The main information sign provides people who pass the 'movement pool' with information about cultural activity in the Centre, throughout the metropolitan area of Paris and the world, by means of video tape recorder, industrial TV, cable TV, telex, telephone service, catalogue service, photostat service,

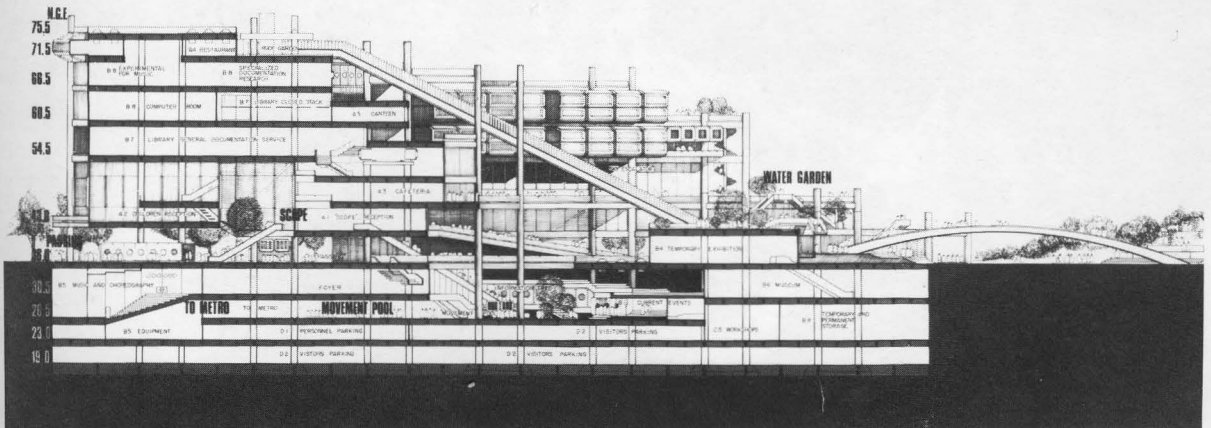


Rough sketch of urban hill



Plan

Section



facsimile service, etc.

At the top of the information sign an electronic bell will enable people to enjoy the works of contemporary composers.

4. Flexibility Capacity of the Centre

4.1 At the functional level

Because the whole space consists of a 27.5 m grid matrix, functional flexibility is possible. Equipment such as elevators, pipe shafts, air-conditioning

ducts, plumbing stacks, electric wiring, pneumatic post, computer system, etc., is placed in the information tree surrounded by the four columns which form the nodes of the matrix grid. In this way equipment can be updated to meet changes and growth in demand.

The grid matrix allows the addition or deduction of complete spaces according to financial or organizational conditions. Flat-floor construction was chosen in

order to meet as far as possible the requirement for flexibility in the library and the museum.

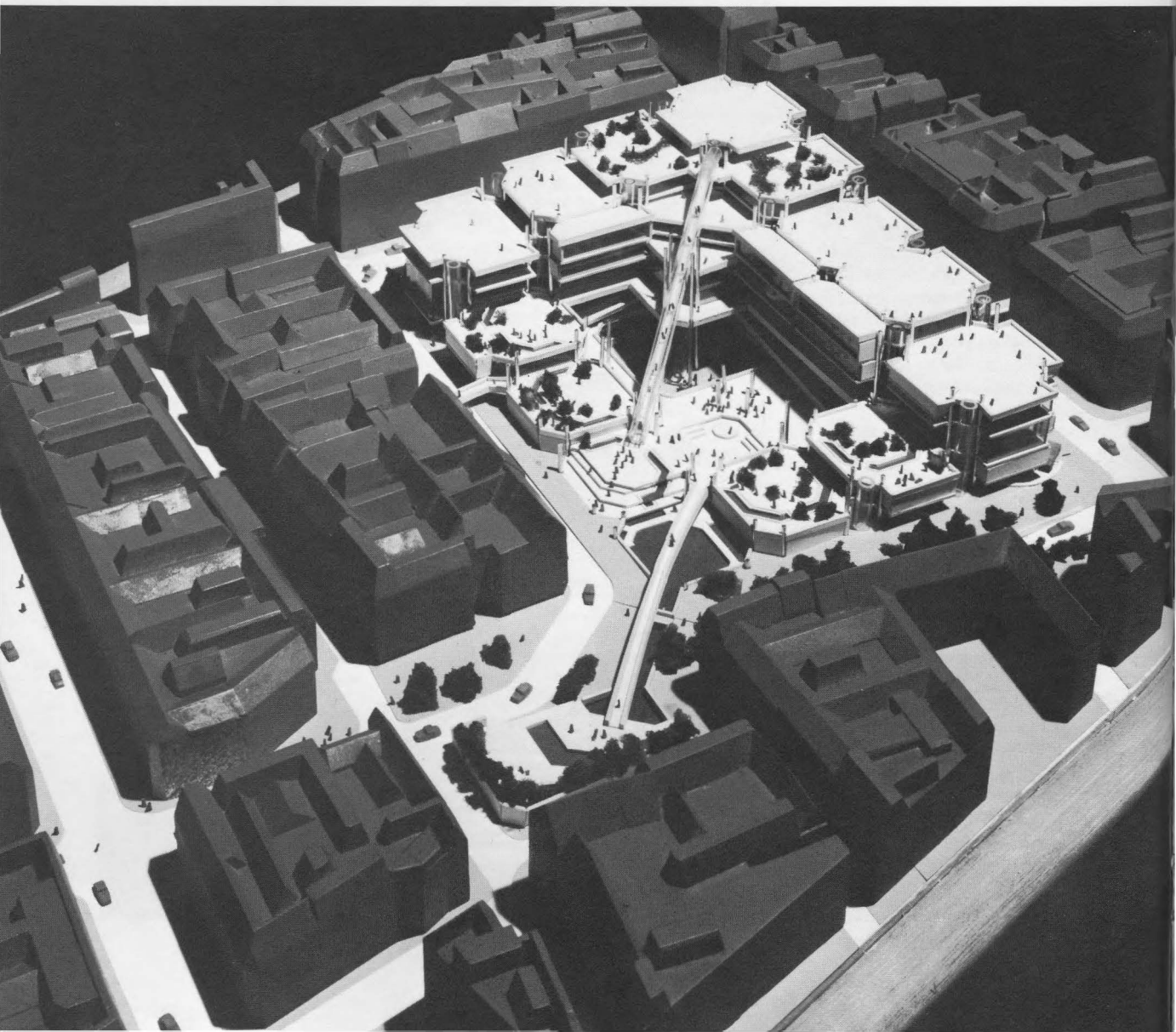
4.2 At the architectural level

The whole form in which the activities are gathered produces an informal composition which permits growth or change without destroying the architectural image.

The stepped form of the building allows for extension on to the terraces.

(Report for Competition 1972)

Model



This was first published as an article in Kenchiku Bunka, a Japanese architectural magazine, in June 1967. This was the year that plans were made for the first new town to be based on the theory of Metabolism – Hishino New Town. Also, during 1964–67 the population concentration in Osaka passed its peak. There was a growing awareness of the need for a new concept on which to base the planning of new towns.

The concept of the network city presented in this article was later used as a basic concept for the Comprehensive National Development Plan adopted by the Japanese Government in 1970. A similar concept of a network city was announced in 1972 by Professor Yoshizaka of Waseda University, and others.

1 From Big Cities to Super-Urbanization

The problems facing cities in general are too numerous to consider here. However, most typical among these are the problems currently confronting the giant metropolises.

City populations have increased rapidly since the Industrial Revolution and have sprawled with the residential areas extending into the suburbs. This tendency is becoming more and more pronounced. In Greater London, for example, the population which stood at 2,500,000 in 1851 is now over 8,000,000. The Tokyo population which numbered 570,000 in 1851 now has passed the 10,000,000 mark. In particular, a staggering population growth of about 250,000 has been recorded in Tokyo for the past several years. This enormous increase in the number of residents has produced an expansion in city confines, creating a 'capital sphere' which cannot be administered within the conventional framework of the Metropolitan government. One possible solution to the problem is to first delineate a wide area within the city's sphere of influence, without regard to administrative limits, and then to draft plans for that area.

The plan for Greater London and the Metropolitan area project for Tokyo (for a radius of 50 kilometres) are designed to cope with the problem of ever-growing populations by extending the city limits. Measures are now being considered to prevent Tokyo and other major Japanese cities from becoming too densely populated. These measures involve the creation of some satellite cities in the expanded territory to absorb the overflow of urban residents. Like the Greater London plan, the basic idea of the regional plan for the Metropolitan area is to designate main development areas in the capital sphere and to establish satellite cities with populations ranging between 300,000 and 500,000 each.

In Japan, the municipalities which are classified as cities numbered 556 in 1960. A look at population movement in the five years from 1955 to 1960 shows that population dropped in 227 cities, or in 40 per cent of the total. 113 cities, or 20 per cent of the total, recorded population increases of more than 10 per

cent during the period. In most of these the population increase occurred through mergers with near-by farming areas, and in many cases in the urban centre the population actively decreased. Consequently, the problems of giant cities and urbanization are limited to those of Tokyo and such other major cities, such as Osaka and Nagoya. Meanwhile, the population of these major Japanese cities has become so enormous that enlargement of city limits is no longer an adequate measure, however great the extent to which it is carried out.

According to sociologist Hidetoshi Kato at Kyoto University, the volume of human traffic carried by the Japanese National Railways' New Tokaido Line each day is comparable to the great movement of the Germanic races in ancient times. A survey by the Japan Broadcasting Corporation (NHK) has shown that the time the Japanese people spend outside their homes in commuting, visiting and shopping is rapidly becoming longer, with the daily average now at 32 minutes. The survey also showed that the scope of their activities is becoming wider. Japan has moved into a 'mobile' age due to this fluid mode of living which pays no regard to city boundaries.

The problems facing contemporary cities arise from the fact that living activities are taking place on a national scale beyond the administrative limits of cities or even the expanded city regions. In other words, the scope of urban lives has become independent from the physical limits of the city. This phenomenon marks the beginning of the age of super-urbanization.

2 Urban Units in the Age of Megalopolis

A recent urban development along the Tokaido shores, called 'Tokaido-Megalopolis', exemplifies super-urbanization developed on lines quite different from the expanded concept of a metropolis.

The term 'megalopolis' was originally coined by J. Gottmann to refer to the urban phenomenon of the North-East United States running from the Carolinas in the south to the state of Massachusetts in the north and including such large cities as Washington, Philadelphia, New York and Boston. It denotes a group of cities linked together organically to form a single sphere of activity and acting as if they were an organic body.

As for 'Tokaido-Megalopolis', there are farm fields, rivers, hills and grass fields between Tokyo and Osaka. But the term is applicable despite these because of the urban activities with a high concentration of social capital invested, a high volume of goods passing through, intense population flow, large quantity and density of information and a brisk energy metabolism. Thus, invisible factors, such as quantity and density of information and activity, count for more in the definition of a city than population density, volume and other visible elements.

If the problems of modern cities were only those of giant cities and of excessive population concentrations, the new town policy for London and the Metropolitan area project for Tokyo would have been major successes. However, the London new town policy has failed because it overlooked human mobility. The new towns, established as independent municipalities in the suburbs, proved to be merely bases for the flow of population, and the population, which was supposed to disperse, surged back to the city nucleus. This tendency is particularly prominent in the small-sized 'dormitory towns', not thoroughly equipped with urban facilities. It is a major cause of commuting congestion. In order to eliminate this congestion and to bring out the potential energy of the outlying areas, medium-distance rapid

transit railway services are expected to play a major role in coming years.

Urban units must be incorporated into the city structure so that even though they are remote from the city centre, they have the same environment as prevails in the city proper. The concept for completely self-sufficient and independent new towns must be changed to establish urban units as part of the city. Links with the existing city structures and with information centres are essential for urban units. In the case of the Hishino urban units links were established with Seto City and with the information centre developed around Yamaguchi Station on a new Japanese National Railways line.

3 Ecumenopolis and Metapolis

The Greek city planner C. A. Doxiadis envisaged an 'Ecumenopolis' which would consist of groups of major cities in the world linked to each other more firmly than they would be to the other districts of the respective countries in which they are located – a situation which would result when megalopolis is a world-wide phenomenon. When such cities are formed 'Ecumenopolitans', crossing national boundaries daily, would establish the ultimate form of civilization on the earth.

Born from existing cities and the individual places in which citizenship is established, each city will be a 'metapolis', an urban unit for Ecumenopolitans built in a super-architecture. A 'metapolis' will be a junction point of mobile information. At the same time it will be the place from which directives are issued. It will be the smallest city unit in the network of the Ecumenopolis, which maintains the individual character of the district as a delicate urban mechanism provided for human encounters and desires.

The progress of the Ecumenopolis will naturally bring about qualitative changes in existing cities. Conversely, Ecumenopolis will only become possible when the metapolises have been formed. As megalopolis is the product of the twentieth century, so Ecumenopolis-Metapolis will be that of the twenty-first.

Megalopolis cannot be discussed without considering regional differences in the country. Likewise, in the process of formation of Ecumenopolis, account must be taken of differences existing in various parts of the world, particularly those between developed and developing countries. Except for countries which can simultaneously achieve intensive agriculture and industrialization through raising productivity and urbanization, most poorer countries will be linked to advanced nations through the pipelines of their open economies and information. In order to prevent these links from being a means for exploitation by stronger powers, it is necessary to establish a metapolis, the information centre and the source of directives, in each country independently.

As a corollary, if a metapolis is formed in the cities of each country, the Ecumenopolis system would be established not as a power system but as a system of settlement for Ecumenopolitans. This would trigger constant massive population movements across national boundaries.

The role of metapolises is to support and control the colossal flow of the 6,000 million inhabitants of the world which might be called a second racial migration. A metapolis will be where men are born and die. It is only natural that urban units planned and constructed from now on should be designed as archetypes of a metapolis, the future system of settlement.

4 *From Neighbourhood Planning to Urban Unit Planning*

Since CIAM, neighbourhood planning has played a major role in modern city planning. At present, the following facilities are considered necessary for a district comprising 1,600 to 2,000 families. a library, schools, a fire station, a police station, an emergency hospital, a post office, public telephones, barber shops, beauty parlours, a children's park, a cinema, stores for daily necessities, repair and processing shops, an administration office, a public health office, and so forth. Since the establishment of the modern city planning theory by CIAM, the neighbourhood planning method – devised for populations ranging between 5,000 and 10,000 and laying out urban facilities necessary for the residents who live in the centre of the area – has generally been employed in all housing and district plans. What facilities should be made available is determined on the basis of the population living there. This is being followed on the assumption that the residents live in a closed community, spending most of their time inside the area. But do closed communities exist in contemporary cities? There are special instances as follows

(1) Closed communities exist in cases where neighbourhood relations have continued through several generations in rural cities. Fellow supporters of Buddhist temples and groups formed to maintain shrines constitute communities as well as being neighbours who invite others in the group for weddings and funerals.

(2) Closed communities are formed in downtown areas, mainly devoted to cottage industry and commerce, where the workplaces and homes are identical. Federations of shops, established to protect their interests, also form communities.

(3) In Britain and the United States, there is a clear distinction between social classes, and closed communities are formed as a means of self-defence.

All these special instances are considerably different from communities in the true sense of the word, and moreover they are fast becoming extinct as urbanization progresses and changes take place in the urban structure through redevelopment. In effect closed communities no longer really exist. Where post-war housing projects have been built on the basis of neighbourhood planning, there is no instance in which a true community has been formed. Even if there are self-government associations, neighbourhood associations and residents' associations, they are organizations for purposes of communication and not for defending mutual interest. The community centre, which has been established in almost all housing projects since the end of the war, now exists in name only. Surveys of housewives living in housing projects have revealed that an increasing number of women bypass stores in the nearest centre and go to the next centre or department stores in the heart of the city. In selecting educational facilities, choices are made without reference to school districts and distances in many cases. Thus, those living in cities do not confine their activities to the framework of the local area, but go beyond into wider territory, forming a distinctive pattern of activity. This makes it meaningless to decide the scale of facilities on the basis of the local population.

Urban settlement plans should be divested of the full implication of the theory of community. The scale of facilities cannot be decided solely by

population size but should be determined by taking existing cities, housing projects and facilities into consideration.

The core system of placing facilities in the centre of the area is best replaced by an open structure. The current rigid practice of setting the population of an urban settlement at 5,000, 10,000 or similar round numbers should be relaxed and the number of residents decided flexibly. An urban unit, even though it is located in the suburbs away from the city centre, is supposed to act as part of the city, and should not be conceived of as an isolated new town.

The rise in the number of cars contributes to the extensive pattern of activity of urban life, and the value of the land in the suburbs becomes equal to that of the city centre through the development of rapid mass transportation systems.

The urban unit, established in the megalopolis conditions, is a pivot for daily activity and has the character of a settlement base. Of urban units, those coupled with the information industry may be assumed to become metropolises after going through a process of metamorphosis.

5 Time-Space Module for Urban Design

Space modules and time modules are important elements in urban design. The space module is designed to define the area of a plan by taking into consideration the scale with which the space elements comprising a city will interact.

Hierarchy of the Space Module

(a) The House

Man's living patterns determine the structures which serve him. The area of a plan ranges from 10^1 m (10 m) to 10^2 m (100 m). In order to maintain order in this area, it is necessary to establish modules based on man's measurements or human engineering.

(b) The Metropolis (urban settlement)

Layout of architecture and streets determine the structure of a metropolis. The area ranges from 10^3 m (1 km) to 10^4 m (10 km). To ensure order in this area, modules equivalent to man's walking distance, or sidewalk modules, are necessary.

(c) The Metropolis

Road patterns determine urban structure. The area covers 10^4 m (10 km) to 10^5 m (100 km). To maintain order, modules based on the distance covered by cars are needed.

(d) The Megalopolis

Rapid transit networks determine the structure of a megalopolis. Area 10^5 m (100 km) to 10^6 m (1,000 km). To maintain order in this area, modules based on distance covered by speed of rapid transit railways are needed.

(e) The Ecumenopolis

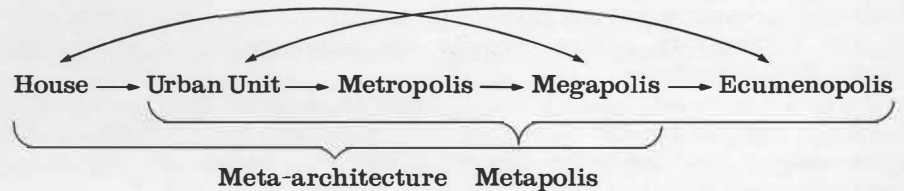
Patterns of air routes determine this structure. The area ranges over 10^6 m (1,000 km) to 10^7 m (10,000 km). To maintain order in this area, space modules based on the speed of aircraft become necessary.

(f) The Cosmopolis

Patterns of satellite communications determine this structure. This area measures 10^7 m (10,000 km) to 10^8 m (100,000 km). To achieve order in this area, space modules will have to be based on the speed of communications.

Each of the above stages should be considered as a step in evolution, rather than the enlargement of continuous area.

The single housing unit, the moment it is part of an urban unit, undergoes a metamorphosis and will complete a decisive change when transformed into a megalopolis from a metropolis. The transformed house structure may be described as a meta-architecture. In the same manner, a single urban unit, the moment it becomes an element of a metropolis, begins to undergo metamorphosis, and, while being transformed from a megalopolis into ecumenopolis, will undergo a decisive change. The urban unit thus transformed, may be described as a metapolis.



In other words, a meta-architecture, as a house unit within the megalopolis, is a super-house equipped with feed-back and control mechanisms, in order to function as part of that megalopolis. A metapolis, while being part of ecumenopolis, is a super-urban unit equipped with feed-back and control mechanisms so as to serve as part of that ecumenopolis.

Urban space modules should be considered as multiplications of a network of differing modules growing as the area they cover grows in size. A modular system may be effective in designing a house, but it would be nonsense to apply the same module to urban space simply by enlarging the measurements of the house module.

In architectural design, I introduced some time ago the concept of the multi-phase module, a method utilizing multiplication of a network of differing modules. Urban space modules may be considered a network of multi-phase modules used in designing a metropolis. Urban time modules refer to the hierarchy based on the length of durability for social use of the elements comprising a metropolis.

Accompanied by the growth of a metropolis into a mammoth metropolis, patterns of expressways and major automobile roads will come to serve as the important framework for determining its structure. However, these mammoth structures, constructed through huge investment, cannot be considered from the social point of view to have a long span of life among the different elements in a metropolis. The life span of highways is determined by automobiles, products of a rapidly developing technology. It follows naturally that despite the huge investments made, the socially durable years of automobile roads are less than those of space for housing.

The hierarchy of socially durable years which determines the cycle of metabolism in a city runs as follows.

(a) Space for equipment

Building facilities, urban water supply and drainage facilities, electricity, gas and other space for pipe-laid facilities are governed by the technological progress. The time-area ranges in a scale based on five for the purpose of comparison from 5^0 (one year) to 5^2 (25 years) but the cycle (time module) of their socially durable years may be considered to be around 5^1 (5 years).

(b) Space for durable consumer goods

Like space for facilities, space for automobiles and space for products (including industrial facilities) is influenced by the rhythm of technological progress. As such, its time-area is in the range of from 5^0 (one year) to 5^2 (25 years). Its time-module may be considered to be in the 5^1 (5 years) range.

(c) Space for service

Space occupied by service facilities needed in daily life – for instance, shops, business facilities, entertainment facilities, welfare facilities, cultural and educational facilities, administrative facilities – is subject to more flexible changes and growth in harmony with changes in living patterns. The time-area is in the range of from 5^1 (5 years) to $5^{2.5}$ (about 50 years), while the area's time-module is in the neighbourhood of $5^{1.5}$ (about 10 years).

(d) Space for living

Of the elements comprising urban space this is the most fundamental space and may be referred to as master space. Its time-area ranges from $5^{1.5}$ (about 10 years) to 5^3 (125 years). Its time-module is regarded as about 5^2 (25 years).

(e) Space for association

This space includes open space, sidewalks, parks and other living space. Its time-area ranges from 5^2 (25 years) to 5^4 (625 years) and the time-module is 5^3 (125 years).

(f) Space for cultural facilities

This space includes natural cultural assets and artificial cultural assets and is the kind of space used for facilities that will be retained as monuments in urban space. The time-area is between 5^3 (125 years) and 5^5 (3,125 years) and the time-module is 5^4 (625 years).

(g) Space for nature

The time-area of space for nature falls in the range of from 5^5 (3,125 years) to 5^8 (about 400,000 years). 5^8 years marks the interval between the glacial periods. Its time module is 5^6 (about 15,000 years).

A definition of metabolic cycles according to elements of composition becomes necessary in order to put the urban time-modules described above to practical use. This is called the theory of the metabolic cycle.

For instance, hierarchies of the life span of spaces have to be designated when drawing up plans for urban units: 1. patterns of nature, preserved green areas, 2. patterns of parks, promenades, sidewalks, 3. patterns of housing districts, 4. patterns of educational facilities, 5. patterns of public service and commercial facilities, 6. patterns of energy supply networks.

In mapping out a comprehensive city plan, it becomes necessary to have a four-dimensional module based on two axes – space modules up to 10^8 m and time-modules up to 5^8 years. This is called the time-space module.

The time-space module serves as a yardstick to measure plan-areas for each of metapolis, metropolis, megalopolis, and ecumenopolis. At the same time, it serves as an important diagram in completing a master system (four-dimensional master plan).

6 Infrastructure and Master Space

The Toulouse–Mirail Project by G. Candilis, S. Woods and A. Josic which received much attention was an urban unit plan centred around sidewalk patterns or 'stems'. This system as it is, however, is unlikely to be feasible for Tokyo. In designing a plan for a metropolis like Tokyo, road patterns

will determine the whole framework more than anything else, at least visually

As explained under the scale module section, sidewalk patterns and the layout of buildings are the most important structure in determining the area of urban units. The second important element is the pattern of roads. Conversely, however, road patterns determine the entire urban structure.

Let us define as the fundamental infrastructuring plan a plan designed to determine the basic visual structure in the scale of the area (plan-area). This means that for differing plan-areas differing fundamental structuring plans are mapped out. On the other hand, however, no matter how much the plan-area may be enlarged, man's living space will remain unchanged. Here, the concept of the subjectivity of space centring around man must be introduced. The time-module (or metabolic cycle) is a method designed to achieve order which man can control so that a city continues to serve him. Man's space (living space) span for cultural assets is the 'urban master space' In contrast, space for service facilities, roads and pipe-laid facilities must be 'servant space' Urban servant space has a shorter life span than urban master space and needs constantly to be controlled and replaced for the convenience of man's space.

Fundamental structures (infra-structures) and master space are virtually equal in urban areas. However, roads and industrial buildings which appear to be largest in size actually have extremely short life spans in the metropolis compared with living space.

This points to a gap between the spacing plan and the time-plan. The present confusion in urban plans may be attributed to this gap.

(*Kenchiko Bunka*, June 1967)

Chapter 2

1 Capsule Declaration

This chapter first appeared as an article in SD (Space Design) magazine, in March 1969.

The concept of the capsule arose from studies started in 1959, using the words 'unit space' and 'cell'. In this article I took an iconoclastic position in order to penetrate the existing order, break down architecture into units for individuals and then seek to establish a new order.

This thesis also relates to the quest for a new image of man and a new community amidst the flux of contemporary society, which are central points to my book Homo Movens, published in September of the same year.

Article 1

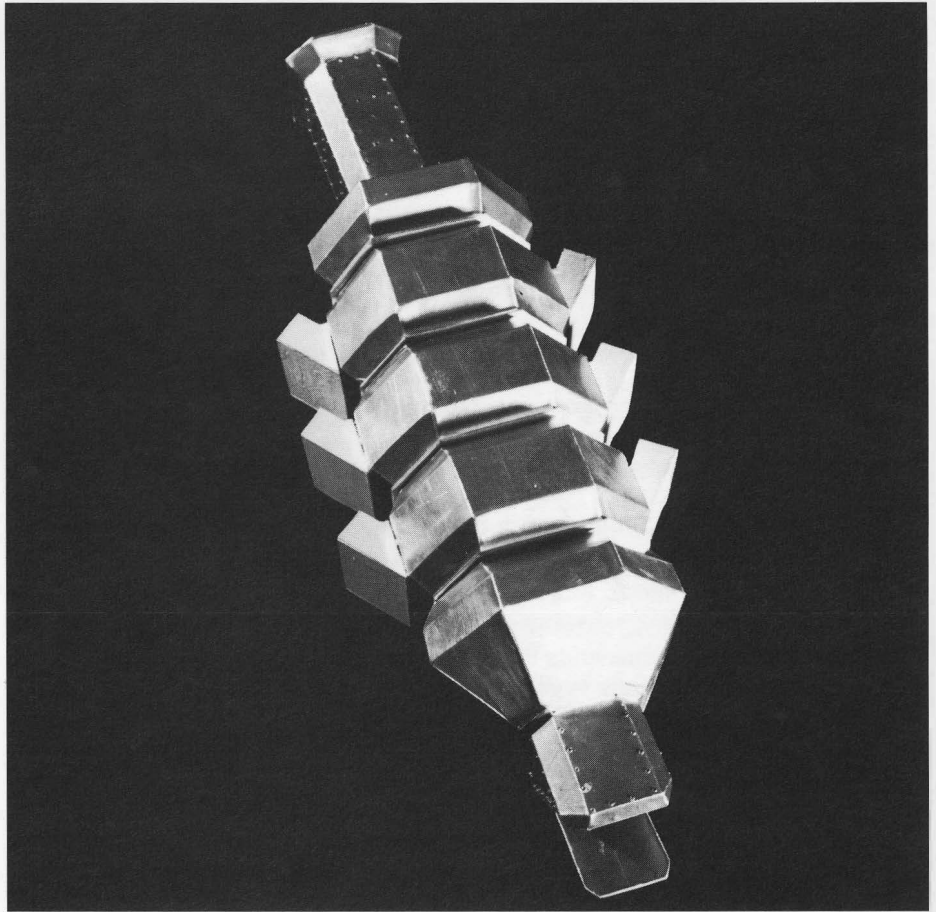
The capsule is cyborg¹ architecture. Man, machine and space build a new organic body which transcends confrontation. As a human being equipped with a man-made internal organ becomes a new species which is neither machine nor human, so the capsule transcends man and equipment. Architecture from now on will increasingly take on the character of equipment. This new elaborate device is not a 'facility', like a tool, but is a part to be integrated into a life pattern and has, in itself, an objective existence.

The word 'capsule' usually conjures up either a capsule containing medicine or the living quarters of an astronaut. The capsule referred to here is a capsule without which what is contained in it would be perfectly meaningless. For example, a spaceship is such a capsule. The capsule which protects the astronaut from space or from very high temperatures or other hazards differs in essence from containers such as coffee cups in that it creates an environment peculiar to itself. A rupture in the capsule, however small, would instantly upset the internal equilibrium and destroy the strictly controlled environment in it. Such a device and the life in it depend on each other for their existence and survival.

Almost all devices which have been introduced into human society since the Industrial Revolution perform the role of a tool. The automobile, for example, is a means of transport used in lieu of the horse. Electric power is a tool which gives light to man at night. These products of modern civilization are intended to make life more convenient. Cyborg architecture, on the other hand, is an object in itself. The human being in the capsule and the film which protects his life constitute a new existence which did not exist in the past.

Human beings may not actually have to be remodelled into cyborgs. Instead, they will equip themselves with various devices with which to perform complicated roles which are beyond their capabilities as living

¹ 'Cyborg': a cybernated organism, hence an organism which is partly automated, based on feedback and information processes; usually appears in science fiction as half man, half machine.



(1) Capsule exhibition at Expo '70

creatures. But without those devices they will be unable to perform their roles in society. A device which has become a living space itself in the sense that a man cannot hope to live elsewhere is a capsule. And signs of such a development are beginning to appear around us.

Article 2

A capsule is a dwelling of *Homo movens*. The rate at which city dwellers move home in the United States is around 25 per cent a year. Soon the rate in Japan will exceed 20 per cent a year. Urban size can no longer be measured in terms of night-time (residential) population. The night-time population taken together with the day-time population, or the pattern of movement of the population throughout the day, will become the index of the features of city life. People will gradually lose their desire for property such as land and big houses and will begin to value having the opportunity and the means for free movement. The capsule means emancipation of a building from land and signals the advent of an age of moving architecture.

The disintegration of a community and the unusual upsurge in migration indicate the advent of capsule space as the new form of dwelling, in the shape, for example, of the mobile home.

The future is anticipated in the fact that in the United States over 5

million people own mobile homes, and the mobile home has become so popular there that it is long past being regarded as a dwelling for gypsies or seasonal workers. Even a considerable number of white-collar workers live in mobile homes. In America today there are about 1,500 mobile home parks under public management. They are equipped with green areas, electricity, tap water and telephone lines. Anyone who parks a mobile home there can use public facilities in the same way as a town or city.

The growth in popularity of mobile homes can be explained partly by the unusual increase of population mobility in the United States. Because of the high fluidity of the labour market, there is a high level of mobility of workers from job to job. Workers often sell their homes and buy new ones in changing their jobs, but some workers own quite luxurious mobile homes and simply drive their homes to the new places of work. High mobility has become a pattern of life.

California has many trailer parks and the cities along the West Coast are designed for motorists with a large proportion of land given to roads. Low population density and the wide extent of city areas make this desirable.

A capsule dwelling can be seen as an expanded form of a house. For example, a car can be considered a room. People who spend much of their time out of their homes 'live' in their cars for a considerable part of their time. In recognition of this fact the car industry has made the interiors of automobiles luxurious, with stereos, reclining seats and air conditioners making a car become a compact room. The car is now no longer merely a means of transport, its interior space is beginning to take on architectural meaning. We are spending an increasing number of hours in cars and our desire to enjoy our time there stimulates the trend of cars to become extensions of dwellings.

If we assume that the capsule is a moving house of *Homomovens*, it need not necessarily be a wheeled home like a mobile home. We should think, rather, in terms of what was considered a tool in the past being converted into architecture.

Changes in living conditions will also require capsulization of dwellings. J Fourastier said that an age would come when people need to work only four hours a week. Certainly, the time will soon come when we need not work as long as we do now, when the cycle of our daily life, which is based on the unit of a week, will change. The week will become shorter and the weekend develop and become more important. The week will consist of four days – Monday, Tuesday, Wednesday and Thursday – and the weekend of three days – Friday, Saturday and Sunday. The cycle of our life will be split into two, and we will spend the week in a stationary dwelling, such as a downtown apartment or home, and we will ride in a mobile capsule at the weekend and go to the seashore or mountains or countryside. The capsule will then be a necessity of daily life.

An interesting diversity in the pattern of our relaxation will also stimulate the capsulization of dwellings. The custom of having a fixed second house for recreation will gradually die out and leisure activities will become more diverse. People will begin to spend the summer in different places each year. A movable leisure house will then be more convenient than a conventional villa. Perhaps the house as permanent abode should be in a fixed place but if the choice exists most people would want to have second homes in different places each year. At any rate, it is unquestionable that the pattern of leisure activities will be increasingly dynamic in future.

A mobile home or something like that will therefore fit the need. It need not necessarily be a motor home moulded as one piece. It may be a panel-type home which can be assembled on the spot by putting together twenty or thirty panels, like sliding doors, by simply tightening nuts and bolts. It can be considered a capsule of a technologically different category.

In the past, when an urban area in Japan had to be mapped out, it would be plotted on the basis of night-time population. But it often happened that a city plotted this way was almost empty in the day-time. The reasons may be many. People living in the suburbs may be in the centre of the town in the day-time to work or attend school. People registered as residents and as night-time population of a given area usually move about in a larger area.

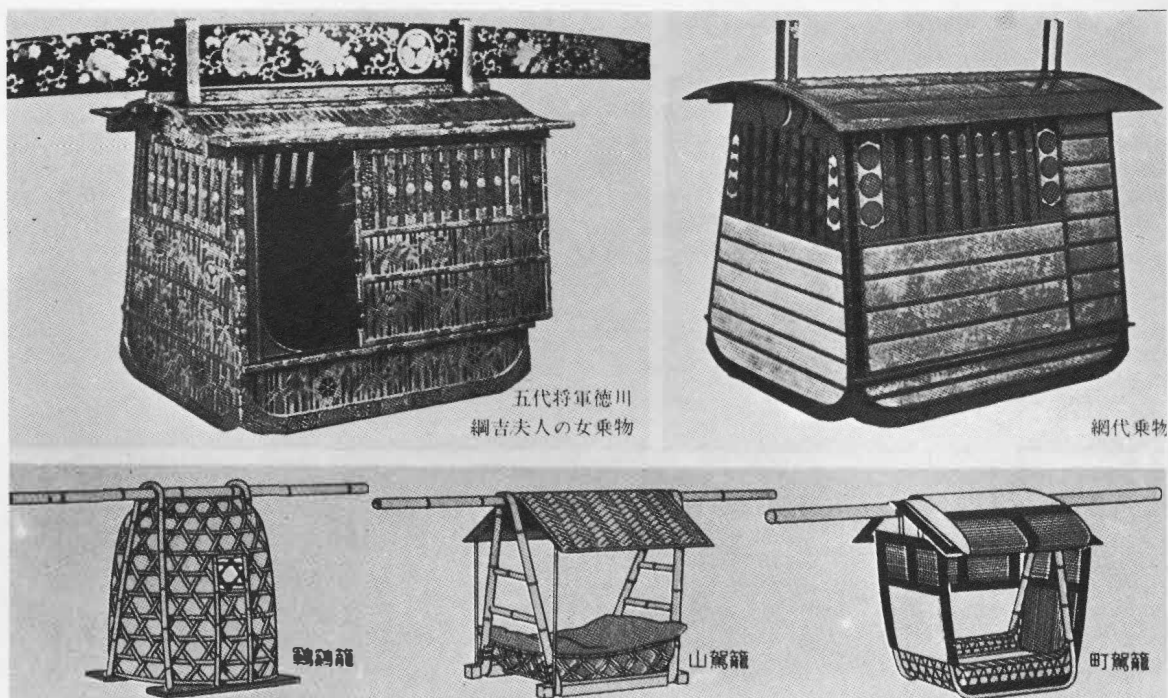
So we must re-examine a city to find the difference between the night-time and day-time populations or plot one populated in day-time only. We have to see the actual condition of *Homo movens* as the dynamic condition of a city. For this purpose, we may have to consider the problem of what sort of space *Homo movens* inhabits.

Trains in American used to be very much like houses. They were equipped with bedrooms, parlours, restaurants and even bars, as well as desks and telephones. They were moving houses with all the conveniences of modern civilization. They may be called capsules because people lived in them and moved in them. And with jumbo jets a large number of people spend much of their time in the air and entrust their lives to a capsule.

Thus, there are two forms of capsulization. In one, a dwelling becomes a tool and is capsulized. In the other, tools or devices, such as automobiles, trains and aircraft, become dwellings and are capsulized.

A stately mansion with a large tract of land is a status symbol today but in the future the space and tools for free movement will be the status symbols.

(2) *Kago*, a traditional capsule for carrying people around



The capsule suggests a diversified society. We strive for a society where maximum freedom for individuals is sanctioned and where there is a wide range of options. In an age when organizations and society determined the city space, the infrastructure formed the physical environment of the city. In contrast, the capsule expresses the individuality of an individual – his challenge to an organization and his revolt against unification.

When we examine the various forecasts for the future, we find a polarization of views. At one extreme, a highly organized society is posited and at the other, a highly diversified society. Teilhard de Chardin, in *Man as Phenomenon*, visualized a convergence of mankind one million years from now into what is called Point Omega. In *Future of Man*, Medawar envisaged a heterogeneous society where all of its members are highly individualized and evolving in different directions.

I believe that our society will be and should be diversified. A society in which the individual is happy is one in which each person can display his individuality and yet social order is maintained, where greater freedom and a larger variety of options are possible. However, this cannot be achieved without examining the balance between the individual and society.

This problem pertains to technical forecasts of future societies. When we consider the process by which an urban society is designed or its environments formed, we find that it is not mechanically created by city planners or architects through the application of technology. For example, roads, energy and communications are communal systems but are nothing more than that. They support human activities but are, so to speak, 'generators' which goad man to demand a freer life. A generator cannot be the goal of life, the construction of a road cannot be the goal of society – the Shinkansen, the 'Bullet Train', a standard-gauge high-speed railway line, is only a social service. Such things are only facilities and goads to man to endeavour to construct a more diversified society.

Future society should be constituted of mutually independent individual spaces, determined by the free will of individuals. Systems are necessary but our policy should be to develop the possibility of acquiring greater spaces for individuals on the basis of system, not one to reduce the spaces for individuals to conformity through the instrument of system. Given this proposition, each space should be a highly independent shelter where the inhabitant can fully develop his individuality. Such space is a capsule. This is the meaning of the proposition that the capsule aims at a diversified society.

The capsule is planned for perfectly free action, formed for perfectly free movement. The system, too, has its own type of movement. The movements of the capsule and the movements of the system are sometimes contradictory and sometimes coincide. The growth of the system sometimes triggers the grouping of capsules. In other words, the theory of multiple structure – that a system (and its units which are generated in the system) should have its independent laws of motion – also applies here.

Article 4

The capsule is intended to institute an entirely new family system centred on individuals. The housing unit based on a married couple will disintegrate, and the family relationships between a couple, parents and children

will be expressed in terms of the state of docking of many capsules of individuals' spaces.

If we are to look for space where the creative spirit of individuals is given free play we will have to reconsider the nature of our housing.

In pre-war Japan, where there was an extended family system based on patriarchy, the most important space in a house was the space where the *paterfamilias* received guests. The drawing room was more important than the living room of the family. The room where the family ate and slept was on the less attractive northern side of the house. Since the war it has become the norm to regard the married couple as the most important part of the household and now the centre of the house is the bedroom and living room of the couple, with spaces for children built later as additional units.

However, the housing of the future will be, I think, an aggregate of spaces for individuals. The existence of a married couple presupposes the existence of individuals but not *vice versa*. Individuals, both male and female, have capsules of their own when they are single. When a man and a woman marry, they will furnish their respective spaces to form a necessary space for themselves as individuals – living space for the couple will not be provided first and rooms added later for individuals around it. A living room comes into being when a minimum necessary unit space which enables an individual to live as an individual encounters with another such unit space and facilities for common use are born. When I designed a housing capsule for the Theme Pavilion of Expo '70, I intended to create a house which would come into existence when such spaces for individuals are mass-produced and grouped together.

If a household forms an aggregate of individuals, the landscape of future cities will be determined, not by expressways or skyscrapers, but by a colossal aggregate of individual unit spaces.

Certainly, such housing will be a far cry from the traditional 'home sweet home'. But I do not mean that the love between husband and wife or between parents and children will be neglected. Rather, the new concept is aimed at abolishing the housing unit centred on the married couple or parents and children and establishing a new idea of a household which attaches importance to the encounter of spaces for individuals.

Article 5

The true home for capsule dwellers, where they feel they belong and where they satisfy their inner, spiritual requirements, will be the metapolis. If the result of the docking of capsules is called a household, then docking capsules and communal space forms social space. The plaza as a religious space, symbol of authority or setting for commercial transactions disintegrates, and the public space with which individuals identify themselves will make the metapolis the new quasi-domestic haven. A self-sufficient community where the daily round is completed within a closed circle will perish. A haven will become a spiritual domain transcending concrete everyday space.

For, if people acquire such capsule spaces and begin to move more freely, will they still not need a spiritual haven? Otherwise one might suppose that frustration might drive them insane. Will not the concept of an 'ancestral home' totally die out in such an age?

The idea of the family home is still a strong one to many Japanese in urban areas. The overwhelming majority of today's urban population are

second-generation city people but their parents or grandparents came to the cities from surrounding agricultural areas. This is common to all cities, not Tokyo alone. The concept is strong even though not all such city-dwellers have a family home where their parents or grandparents live. The average Japanese city-dweller's notion of a family home is very abstract. He would put it in this way: 'I'm told that my ancestors came from Kyushu, but I have neither an ancestral tomb nor a home in Kyushu.'

The notion of family home will become increasingly abstract hereafter. Man will become correspondingly less capable of great mobility without some spiritual support or spiritual haven to take the place of his concept of a family home – notwithstanding the greater convenience or physical comfort. The more mobile man becomes, the greater his longings for a haven.

When we search for it, we first think of nature. Nature is a more abstracted form of family home than such individual birthplaces as Kyushu or Hokkaido, and the feeling for nature is closely akin to that for a family home. The feeling which a city-dweller entertains about nature is an abstract form of his feelings about his family home.

I feel, however, that men's spiritual haven in a future community will take a slightly different form. I think that men living in a city are going to build a new one. The feeling which people show when flocking to a plaza or square or taking part in a demonstration or holding a festival seems to reveal what such a spiritual haven might be.

The response which men feel in such a place differs from the family-home-consciousness evoked by nature in that it is created by the sharing of a certain common social space. It is manifest where many people live together instead of separately in isolated places. It is a repose which one finds in the midst of a large city. While the home consciousness is identified with some specific region or community, the spiritual repose which one finds in a large city is related to human solidarity, the equipment of the city or a symbolic space in the city.

Then what type of urban space can furnish such repose?

A public space, terminal, department store, hotel or university campus can serve. All these places are where a large number of people flock together and where, in a sense, the architecturalization of the street is found. A facility in which a city-dweller can find repose should be one which permits multiple choices. Take a hotel for example. There one can put up for the night, meet other people, hold a conference, give a wedding ceremony, or swim in a pool. The development of such a multi-purpose space is progressing in hotels, and it can be said that hotels are becoming the centre of a capsule space and a new spiritual haven.

How about universities? At present, campuses are spaces within a city but separated from the whole. However, universities will increasingly take on the character of cities in the future. Universities will cease to be spaces where only the elite study but will be socially open. Campuses will no longer be places for research and education alone but will become forums for the public, housing for the students and parks at the same time. They will increasingly become multi-purpose spaces.

A Japanese department store functions as an adult education area and as a place where a large variety of activities are possible. The width of choice will become a very important factor of an information centre or a space for common use. Our department stores provide a variety of data on such things

as current trends in school education, cooking, new fashions and new household appliances. If an art exhibition is being held there, you come into contact with the latest trends in fine arts. Like the *agora* of a Greek city, a department store today is a multi-purpose information centre and a place of public entertainment.

A terminal is the junction of different means of public transport, and a large number of people meet or at least encounter each other there. Because such shopping and leisure facilities as department stores are usually built at terminals, there are ample opportunities for a terminal to grow into *en-space* for common use for capsules.

In large cities of the future, a large number of new-style plazas and squares, a large number of new-style homes, will come into being where individual capsules will be docked to each other and create a social space. Such space may be called a haven within a city, as opposed to a haven outside the city, remote from the city.

The conventional community centres of public hall, park and marketplace will then lose their place as the centre of city life. Independently of such spaces for daily life, a starting point of spiritual life – an information centre – will come into existence, and a new type of community where individuals flock together will emerge. Such a community may be called a 'temporal community' as opposed to the conventional regional community

Article 6

The capsule is a feedback mechanism in an information-oriented, a 'technetronic', society.¹ It is a device which permits us to reject undesired information. Our society is emerging from the industrial age and entering a technetronic age. The industrial pattern based on the manufacturing industries is changing into one based on information industries, such as the knowledge industry, education industry, research industry, publishing industry, advertising industry and leisure industry. To protect us from the flood of information and the one-way traffic in information, we should have a feedback mechanism and a mechanism which rejects unnecessary information. The capsule serves as such a space.

A technetronic society will not automatically form if the present information-processing system develops further on existing lines. Proof of this is to be found in current information media. Whether through television or radio or newspapers, a large amount of information flows to us from a central station. We can make a choice by turning the channel knob on the TV receiver, and this is probably the only choice we have, but we cannot totally reject the deluge of information. In the present age, we cannot totally reject such information, and still less is it possible to issue instructions to the key station to send only such information as we want to have, because we have no feedback mechanism.

Just as an astronaut is protected by a perfect shelter from solar winds and cosmic rays, individuals should be protected by capsules in which they can reject information they do not need and in which they are sheltered from information they do not want, thereby allowing an individual to recover his subjectivity and independence.²

¹ This term is taken from Zbigniew Brzezinski's *Between Two Ages: America's role in the Technetronic Era*, Viking Press, New York 1970. It is a contraction of 'technological' and 'electronic'

² The capsule is defined as a space which guarantees complete privacy for the individual. It assures the physical and spiritual independence of the individual.

There are two stages to the technetronic society. At the first stage one can buy as much information as one likes by just paying for it. One may be glutted with information, and only that part of the information which is digested becomes mental nutrition. The first-stage technetronic society is one where information has a monetary value.

This makes the second stage an age of creative information. However, in the second-stage technetronic age, will it be possible to buy creative information? I rather think that such information will have to be bartered in exchange for specific information which one may possess. In such a society, a capsule which can transmit, receive and feed back information at any time one likes will have a high value.

Article 7

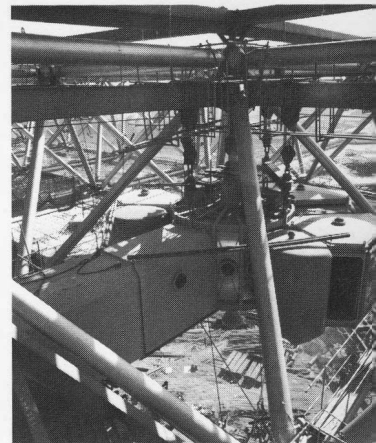
The capsule is the ultimate form of a prefabricated building – an industrialized building. Industrial production of buildings becomes possible when the production process is divorced from the conventional building construction industry. The rolling stock industry, aircraft industry and motor vehicle industry are models for that process. Just as mass production was revolutionized by the Model T Ford, so the capsule will make possible qualitative conversion of the industrial production of buildings. As with the Ford Mustang, capsules will be mass-produced on a selective system which combines parts, not a standardized mass-production system. The time will come when mass production will not produce standardization but will ensure variety

In the past prefabrication of buildings was developed in order to rationalize construction. This way, prefabs enabled the building industry to lower costs, shorten the period of construction and unify the quality of the goods produced. Regrettably, however, prefabs have so far failed to produce in construction a revolution in quality of the order of that brought about by the Model T Ford or the Mustang.

Prefabrication is the basis of the capsule, but capsule housing is intended to produce a qualitative change in the meaning of a building.

Prefabricated buildings in the past consisted of standardized and factory-produced pillars, beams and walls, but without interchangeability of parts. A cardinal feature of the capsule, on the other hand, is that its parts can be replaced. The toilet unit and bath unit can be renewed at any time by trading old units in for new ones. Moreover, proliferation is possible by adding additional compartments. Therefore, a capsule must be composed with such functional units as a bath unit and a kitchen unit as basic units. This marks a switch from composition by parts to composition by functional units.

Once given capsule houses based on this concept, unique and highly individualistic houses can be assembled by putting together functional units in whatever way the owner chooses. Great variety will be made possible through assembling mass-produced units in different ways. Such a new stage of prefabrication is one step beyond the industrialized building construction designed for rationalization and standardization, and its aim is to produce space which will react sensitively to the changes in people's life styles. The new system, which may be termed a selective mass-production system, will enable us to acquire a new form of housing and adapt to the technetronic society.



(3) Capsule House, Expo '70, hung from mega-structure

The capsule mentality is opposed to uniformity and systematic thinking. The age of systematic thinking has ended. Thought disintegrates, is dissolved into separate, powerful words, and is capsulized. A single word, or single name, can spread, transform, permeate, stimulate an entire society and help to mould the thinking of an age. A building is dissolved into parts and is capsulized as functional units. A building will be defined in the future as the state of spatial-temporal docking of more than one capsule.

We have been considering a capsule entirely physically. Of great importance, however, is the philosophical background to the concept. Capsules have been conceived as weapons with which man asserts his individuality and freedom in today's chaotic world.

The relation of the capsule to modern buildings can be seen by analogy with the traditional concept of knowledge. This is a magnificent system of learning constructed like a medieval cathedral. The European system of knowledge was a comprehensive one of a pyramidal shape, explicable from a single fundamental principle. However, this system, best exemplified by Kant, has little application today. It is more important to have a sensitive weapon capable of reacting to the changes of the times and society and the changes in modes of perception. Words are parts, separate parts. Each word, however, moves man and can trigger off various ideas and hypotheses. Fragments of thought, in single words, like a neutron which has hit the nucleus of uranium, create new hypotheses and new ideas in a chain reaction. Any system of thought constructed earlier can never remain stationary. It is broken up by sharp fragments in single words and scatters, and its fragments are diffused like new seeds.

Given our present intellectual background the words like *Homo movens* and the capsule may be nothing more than fragments of ideas. But they move the age much more powerfully and impellingly than any magnificent system of thought. Words such as 'pollution', 'ecology' and 'liberation' are like bullets. They are, so to speak, capsulized thought.

Such words apply in the study of cities and architecture. When our group proclaims 'metabolism', it does not presuppose any system of thought previously established and built up. It rejects all primary conceptual definition. Its effectiveness and the attention given it depend upon its relevance to the problems facing contemporary architecture and planning.

The classical school of city planning and architecture saw the job of an architect as negentropic, as running counter to an increase in entropy. The job was defined as 'giving geometric order to a state of disorder'. But metabolism as we define it sometimes aims in the opposite direction. The metabolism of cities and architecture is defined as a control mechanism, that is, a shift to a more complicated, dynamic and uncertain state from a state of fixed classical order, or a shift to a more simple and certain state from a state of disorder.

Despite efforts for system and order, our modern civilization seems to be heading towards increased entropy, towards chaos. All animate things, including the universe, seem to be moving headlong toward what Cladius called 'the death of heat'. To emerge from this stage man should make his universe open in construction. Just as the universe as an open system accepts new stars and creates what Ludwig Boltzmann called 'the state of disequilibrium', we can be rescued from the ever-increasing disorder and

cold if cities and buildings have an open structure.

If we break up a city or architecture into spatial units we find that their composition takes on variety, individuality and metabolic character. If these features develop, a construction and an organization which enable the city to exist as groups or clusters become necessary at some stage. We may call them an infrastructure. This infrastructure stimulates diversity and metabolic character rather than unifying the whole, and such diversity and metabolic character have greater possibilities in the next dimension. The entropy increases. The time will come when a more powerful construction and organization for the next stage are discovered.

The basic kinetic form in which space develops is metabolism, and its process is expressed as an increasing entropy 'Construction' (minus-entropy) which is repeatedly put in during the development of space metamorphoses the 'organization' of the space. Modern architecture needs a methodology of metabolism and metamorphosis.

The space of a city and architecture once regulated the existence of man and defined the purpose and norm of man's actions. Look at a walled city or a cathedral of the Middle Ages. Look at an urban community with a square or plaza at its centre. The life of its citizens was confined within it and social norms were imposed on their acts. Now, however, architecture is no longer a device to control men. It is a means whereby men control technology and machinery. It is always only one element of a city and one phase of a changing process along the time-axis. Architecture is, in itself, a device to produce functions but is only one element in the composition of an area. An encounter between acts of man and architecture takes place at a level which transcends architecture.

Modern architecture always exists as a part. Here the concept of a capsule is born.

In the past, design started in the realm of ideas, with the architect asking himself a question, for example 'What is a university?' It was considered the job of an architect to establish an idea first and then give it a tangible expression as faithfully as possible. The mission of an architect was to start from the whole and give a faithful expression to the total image.

However, whether we are dealing with a university, a terminal or a department store, a panorama like the one obtained from the apex of a pyramid is completely meaningless if multi-purpose and complex functions exist concurrently. Architecture has to be seen as an aggregate of extremely capsulized and diverse functions.

Architecture is nothing more nor less than an aggregate of countless functions (therefore, capsules) and may be defined as a group which comes into being when a number of capsules encounter each other. Accordingly, an architectural structure can be dissolved into many spaces each with different functions. The spaces thus taken apart are capsulized, and the state where countless such capsules conglomerate and are docked in time and space can be defined as an architectural structure.

2 Meta-Architecture

This was first published in the Japanese architectural magazine Kenchiku in September 1962. At about the same time I was working on the design of the Prefabricated Apartment House using cubic units.

More than merely holding to technological industrialization and mass production the philosophy of Metabolism seeks to use the technique of prefabrication in order to produce architectural works which are rich in individuality and variety. With the metabolic cycle an ecological system is introduced into architecture.

1 Quantity and Quality in Mass Production

Mass production in architecture cuts costs as much as possible by large-scale production, as well as rationalizing the process of construction. At the same time, it modernizes the industry.

As is stated by Yona Friedman of the French group GEAM the most important role expected of modern architects is to pursue the improvement of quality as well as the achievement of greater quantity. For this reason, the first problem is that of how to produce 'quality by mass production'

This can be obtained by quality control in the production process, through which the degree of quality of architecture can be measured, but basic studies of the measurement of physical quality of architecture have yet to be made. Evaluation of architectural mass production will then be possible after the measurement of quality. Designing will become easy while quality level can be secured and costs cut.

The standardization fashionable in the early years of this century, dubbed 'domino' by Le Corbusier, and the concomittant experiments in mass production were all efforts to discover the new nature of space through the modernization of architectural production. For Jean Prouvé it took half a century to promote architectural production as high as that of automobiles and aircraft. However, these efforts went only so far as to create the prototype of a new architecture, not the architecture itself, although this progress was essential in the improvement of architectural production and the development of technology. In 1936 Jean Prouvé tried his special curtain wall system at the Roland Gaross Air Club. This later became a major feature of American architecture. Mass production in architecture needs a completely different base from that of automobile production. We should not, however, neglect the matter of architectural space (which becomes the main objective of mass production) by too much attention to the means or quantity of mass production.

It is my opinion that flexibility and change hold the key to quality in mass-produced building. As long as the whole structure is constituted of many units of different lengths of durability, it may still be destroyed when the individual parts of the shortest durability give out. An enormous

number of buildings become defective for this reason. It also frequently happens that the capacity of the structure becomes ineffective through social changes such as a change in living standard, family structure, organizational structure and production system. The separation of units in the mass-produced structure makes it possible to match the changes and to effect an improvement.

It quite often happens that modern equipment is replaced for structural reasons. With changes to the equipment and living space improved quality in the creation of a new living space become feasible. It is these changes which constitute the quality of production and both the standardization and the personal characteristics of living space.

Such architecture I called 'Meta-architecture', short for Metabolic architecture. Architecture must be precisely organized like a space rocket and at the same time must have free form.

2 Selectivity and Changeability in Meta-architecture

At a party in Japan during the World Design Conference Jean Prouvé said that the technology of architecture must reach the same level as that of the automobile industry; people do not complain about having cars styled the same way, and likewise will have to put aside the idea of personalized housing.

The annual production of automobiles in Japan amounts to as many as 250,000 (1961) while the annual construction of government planned houses is 20,000 (1961). However, if privately built houses are added their production will outnumber that of automobiles. Disregarding the demand pattern and the difference in mechanism or production, there is little difference between the present mass production of houses and of cars.

Yet, let us compare the length of durability of concrete houses (seventy-five years), steel houses (thirty-five years) wooden and plastic houses (thirty years), while the average length of durability of automobiles is only four years (according to the list of durability of fixed assets). Dealing only with prefabricated houses, concrete houses may last for nearly forty years, and the steel houses twenty years. This means that even mass-produced houses last five to ten times longer than cars. People buy cars with the idea that they can replace parts easily, and as a result the production-consumption cycle is fast. The short durability of cars also increases the degree of changeability and satisfies the desires of the consumers.

Here, the changeability of parts becomes more important than selectability of products. People respond to change by replacement and abide by the uniformity caused by standardization. On the other hand, mass-produced houses have longer durability, with less scrap value. The changeability of housing parts then becomes less important than the selectability of products. This is another reason for giving importance to variation in a system of mass-production planning. The durability cycle can only be considered after the mechanism of the process of production-consumption-production; therefore, even if the architectural industry has achieved mass production, it would be a long way from the production of consumer goods, when after-sales service completes the production-consumption cycle. The durability of mass-produced parts of Meta-architecture determines the balance of selectability and changeability

3 Functional Unit and Space Unit

The space that matches the changes – metabolic space – has been found through a methodology of metabolism. Architectural changes are those made to account for durability, living mode, family structure, the space for equipment, the changes in relationship of positions of equipment and that of residential areas, which is the ‘change of parts’. But there is another type of change, namely, the change of space. Corresponding to the two types of change are the notions of functional unit and space unit.

When architecture is separated into parts and each performs a complete function it is a functional unit. (Where with concrete blocks, and walls with small-size panels, each unit does not fulfil the complete function of the wall, but works as only a part of the wall, these are not functional units. Then, the replacement of one concrete block or small-size panel does not correspond one to one with the change of function achieved by placing the units of parts close to each other.)

Within the cycle of a circulation mechanism, the functional units feed back information on change to the production process. A space unit is that which consists of spaces of different functions. From the point of view that each constituent space corresponds to each different function, it can be called a functional unit. For instance, it is impossible to expect variations, matched to characteristics and functions, from one-room-system houses, where living room, bedroom, bathroom are separated only by partitions. The functional separation of space such as into Louis Kahn’s ‘master space’ and ‘servant space’ is intended to make possible future progress in space utilization.

The prefabricated houses by W. Stump, and Otaka, and the Orphanage by Van Eyck are examples of space units. The equipment space unit is already possible in mass production in one unit of movable equipment and will be possible in the future when rooms are made in one unit from light metals, plastics, or light concrete. But there is a difference in the cycles of the equipment unit and the living space unit which will immediately be referred back to the mass-production process. For that reason, a connector is needed which can relate to functional units and space units, with their different rates of change. It should be borne in mind that the technique of jointing is both that of combination and separation.

4 Dynamic Module – The Technique of Modulation

As long as mass-produced architecture consists of spaces of different characteristics and of parts of varying durability, the numbers of sequences of numbers involved in determining the proportions generate different bases and significance. The dimensions of the standardized materials of prefabricated architecture become more closely related to the production process and the modulation used in human engineering. The equipment unit in which the human being is active needs a dynamic module, while the quiet living space such as a bedroom can be treated as a static module.

Le Corbusier’s modulator should be used as the module for proportion. The module which changes in the passage of time, the module of time length of durability, becomes the point of mass-production planning. These modules have different functions and significance. In fact, we have been living in modules of invisible graphic patterns. The functions of each module may contradict one another and yet be integrated into architectural space, so

one cannot measure by a standard module, or it will interfere with the functional unit. Now it becomes important to find the corresponding points of different modules in a multi-dimensional module.

Taking a car as an example, there is no standard module to measure all the parts as there are screws, volts, cogs, electricity, etc. Rather there is a standard measurement for each module at the point of joining which makes it possible to replace parts, and to mass-produce with freedom of design.

5 Problems of Designing Prefabricated Apartment Houses for Mass Production

When we divide architectural space into types of unit, we find functional units and space units. In my designs for prefabricated cubic units it is the function rather than the material which determines the size. The space unit that is made by a prefabricated unit is 2.7 m × 1.35 m for a living space. A kitchen unit or bathroom unit, having movable equipment, needs a different form from that of a living space unit. It needs quite a different production process and it lasts for ten to twenty years. Two units are combined when a living space unit becomes larger. Space unit systems are seen in the laboratory of Pennsylvania University, by Louis Kahn, the Orphanage in Amsterdam by Van Eyck, and the prefabricated house by B. Goff, but in them the functionally divided space is used haphazardly, so it is feared that they may become low grade architecture. Thus, an orderly sense must be given to the different space units. In the Prefabricated Apartment House a prefabricated unit functions as a hinge joining the living space unit, equipment space and storage space. I see the living space as the main area and storage and equipment spaces as merely servant factors.

6 Plan for Growth and Change

As spaces change according to changes in life styles and the durability of the materials, those changes must not only reflect the ideas and wishes of the people using the buildings, but should also reflect the principles of changeable form, which, according to Yona Friedman of GEAM, is the formation principle of the city. An important role for architects is to make engineering research into large-scale box-type buildings which can best realize changeable form, but this cannot be done without looking at the relationship between the architect and society. The architect should not throw his works at the public but should study and reproduce the mechanism of changes which will reflect the opinions and taste of the people, who are not the specialists. The concepts of 'mechanism of changes' and methodology of metabolism are designed to provide the links so as to make the notion of changeable form acceptable to the public. Prefabricated architecture helps architecture to approach closer to changeable form. It enables one to design changeable form including the process of 'change of parts' through the passage of time.

Although it may mean radical alteration in each building type such as apartment houses, privately owned houses, etc., a clear image of changeable form arises out of the opinions of the buildings' owners and the architects' system of changes. This system operates through producing different modules to deal with each variable: a time module for the arrangement of different cycles of change, a space unit for the arrangement of different scales, a joint module for the arrangement of linkages. In the case of an independent house, the prefabricated unit functions as a linkage.

In the case of an apartment house the staircase unit becomes the joining point which gives the work its identity. The slab of the staircase connects the eaves on both sides. If the house consists of four box-type units, seven combinations are possible, but in reality, due to the characteristics of movable equipment and staircases, we can expect only five.

A modulation system involves the coexistence of dynamic and static modules. The nature of the module becomes more and more important as architectural production is industrialized and materials standardized. But I am not much interested in modules which cover the whole space of architecture as a single network.

Several features have to be measured to produce a module: materials, production, processing, movements of parts, functional units, space units, durability. There are a great many different units. Each has to be harmonized with the others for practical use instead of integrating all of them into one standardized unit. It may be possible to separate units into equipment space and architectural space. Equipment space is the functional area for the kitchen, bathroom, etc., and architectural space is for living space, dining room, and bedroom with consideration given to waste and leisure. In this architectural space there are dynamic measurements and static measurements, which I describe by graphic patterns in my designs in order to determine their positions.

The ground plan of the Prefabricated Apartment House was determined by the traditional units in Japanese architecture, the measurements 90 cm by 135 cm. (These are the dimensions of floor mats and wall panels in traditional wooden buildings.) Sections are joined within the grid formed by these dimensions, in groups of two or three, 90 cm \times 3 equalling 135 cm \times 2. The use of these space units contributes much to the flexibility and the changeability of the parts.

A time module is essential for prefabricated architecture to function as materials are consumed within the circulation mechanism. The word 'module', after all, referred to individual spaces before it came to be used by the designers.

In many countries of Europe and in Russia prefabricated buildings are made from two-dimensional plate units. There is a movement from large-scale blocks to panel systems in Russia and Sweden, involving the use of stone for the structural walls (exterior) in traditional designs with protection from the cold weather as the most important element.

The two-dimensional plate can be related to other building methods in the following scheme (1) Dot unit brick buildings, concrete block; (2) line unit: columns and beams structure, (3) surface unit: panel; (4) cubic unit: cubic block system. As the dimensions increase, the unit changes from a functional unit to a space unit. I am of the opinion that the trend towards greater use of the cubic unit is inevitable and necessary. However, the Russian system of producing one whole block of a house in a factory is unsatisfactory as it denies change in the functional unit and space unit. They cannot be ideal since the blocks have combined those units of different lengths of durability; moreover, they have ruled out the change of equipment space. The dimension of the unit and the function of joining should relate to the method of combination. A formula gives the dimension in the desired relationship:

$$n = m - 1, \text{ where } n \text{ is the joint and } m \text{ the unit.}$$

Why is it that the housing problem has been unsolved for so long, although it has been one of the biggest problems in post-war Japan? For one thing, it is because of there being such an enormous population for so small an island, secondly, because of the poverty in both economy and politics. We should not be complaining all the time, but should act by approaching the solution step by step. The first problems to appear are those of housing production.

In general, concrete buildings consist of line and surface units. Architectural mass production starts from the standardization of construction units. However, this standardization must inevitably deal with important details of joining for construction. For instance to make buildings earthquake-proof, you have to make the whole building strong. Yet, it is very hard to put faith in the construction process of mass production, especially dry construction methods. In construction based on structural unit-by-line materials we had to adopt the methods of wooden construction, so we could not avoid the detailed techniques used for wood structure and could not make full use of concrete materials in the detailed joining. Is it not hard to expect from plastic materials the co-ordinations of linear materials?

Construction based on line materials (steel frame) protects against earthquakes but fireproof materials must be used with it. It may be a long time before this method can be put into practice but it is not impossible. At the same time we can find out what manufacturing methods are based on traditional concrete manufacturing and with application we can advance the techniques. When we construct on site, the joints between the parts are different in structure, and it is necessary to decrease the number of processes for a completely dry construction. This leads towards fundamental mass production in architecture. Here again the problem of joints between the structural units arises. In the panel-fixing method, structural inflexibility prevents general planning production as each structural unit has to be in a perfect shape for transportation and combination.

As for the joints between structural units, it is better to join surface to surface rather than dot to dot, especially when protecting against earthquakes. Here also, line joining on the surface is the best solution.

I have already mentioned the possible direction in combining line material units. Cubic structures provide storage space between the units and residential space; the slab provides space for free use. Cubic structures piled up structurally make a column. The floors are cantilevered from each storey and stretched in a fine shape.

There is still much work and research to be done on design for mass-produced houses. In this, the systematization of construction and 'change of form' are the most important features. The main problems of prefabricated housing have been neglected in favour of dealing with the cycles of manufacturing and parts replacement rather than the process of the panel making, standardization and mass production. One of the problems lies in the systematization of construction which combines the transportation system and the assembly system. Prefabricated housing cannot be considered apart from prefabricated construction. A new method, called post-fabrication, in which assembly is a part of the creative process, might provide an answer.

Prefabricated Apartment House, 1962

92 This was planned as a combination of four types of reinforced concrete units, using high-tension bolts. When the plan was prepared, prefabrication in Japan was only done by panel construction.

The main advantage of prefabrication is that costs are reduced by quality control in production and by mass-production methods, but even more important in this plan is the way that each individual can express himself or herself within the group form because of the flexible way in which the units are combined.

The traditional technique employed in Japanese architecture known as *gangyō* (geese-in-flight array) not only can be adopted here horizontally but also, using the varying natural conditions on this slop-

ing site, makes a vertical *gangyō* silhouette, matching the geography of the site.

There is a direct approach to each unit through an open staircase. Capsule utility units (kitchen unit, children's nursery unit, bath unit) are installed on staircase landings as if attached from the exterior; at any time they may be replaced by newer units.

(This proposal was published in 1962, as the outcome of two years of research carried out during 1960 and 1961. It was presented as a proposal for an equipment capsule of 'master space' and 'servant space' of which the 'servant space' would have a shorter metabolic cycle. Ten more years were spent on technical studies of this capsule, culminating in the Capsule House in the Osaka World Exposition in 1970 and the Nagan Capsule Tower, built in 1972.)

Prefabricated Apartments

Many of the pioneers of modern architecture have introduced

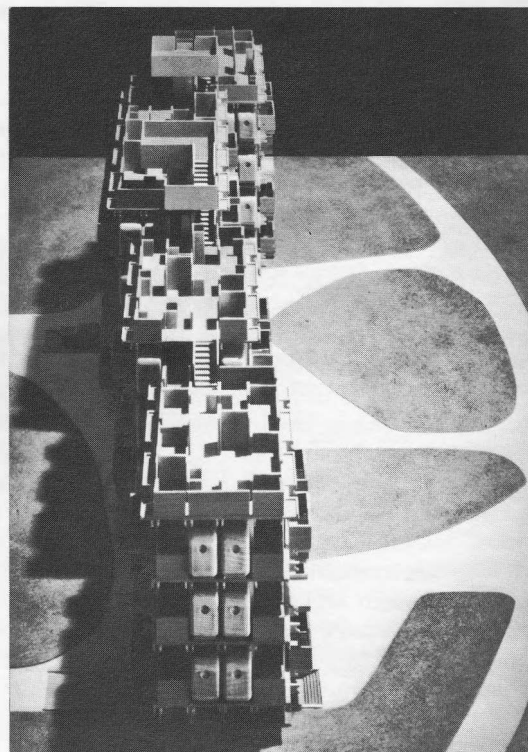
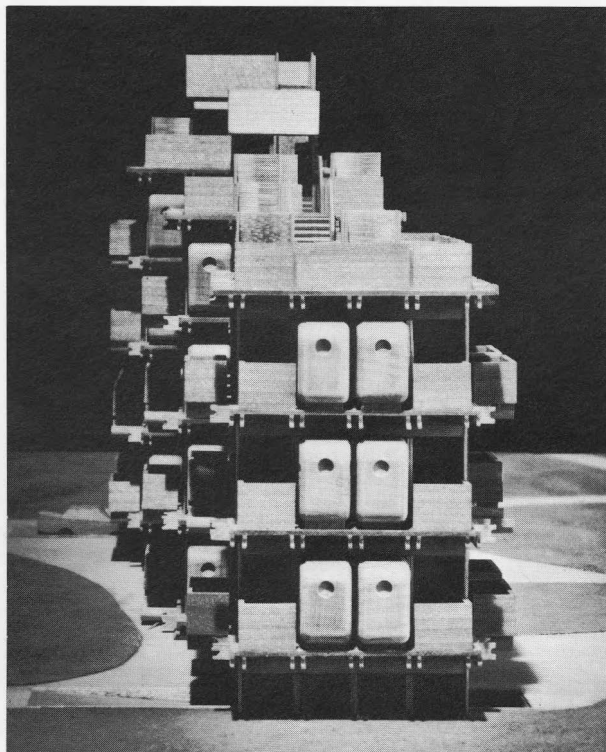
modern production systems into the construction industry. Standardization, prefabrication, and mass production are successive steps in producing large quantities at minimum cost in the least time possible.

However, there is still a large gap between variety and standardization, quality and quantity, permanent architectural solutions and temporary architectural solutions, as far as collective dwellings are concerned.

The last concept is very important as it presents the idea of change or interchange of the parts that make up a dwelling which consists of elements with a different life span. Part of the building's original equipment such as the installations may give out before the structure does and yet their lifetime determines the useful life of the building as a whole. This is an example of the need for interchangeable parts. On the other hand, changes in a family which inhabits a dwelling such as an increasing or decreasing number of

Model showing a capsule (bath unit, kitchen and closet) attached to main structure

Aerial view; *gangyō* (geese-in-flight array) silhouette is obtained vertically and horizontally





Detail of structure

members, a change in the family's economic possibilities or social position are reflected in functional or material changes in the dwelling.

These thoughts are part of Kurokawa's theory, which is quite complicated. He is aware that mere standardization of sizes and production in quantity don't solve the problem. Standard parts should not be limited to aesthetics or elementary geometry but should take into account function, materials, equipment, and duration. The result leads to connectable parts and connecting systems which permit greater flexibility in solutions such as the one presented here.

(Arquitectos de Mexico May 1966)

In today's society, versatility in a design is both a reflection of the wishes of the people using the spaces and an expression of the architect's sense of plastic form in change. As Yona Friedman asserts, an architect who is not an organizer should not turn his hands to urban design. This is very important in connection with the architect's relationship to society.

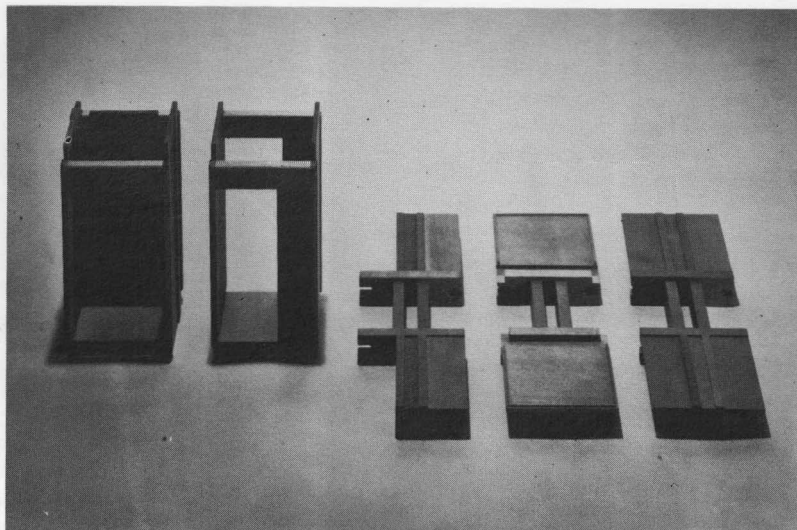
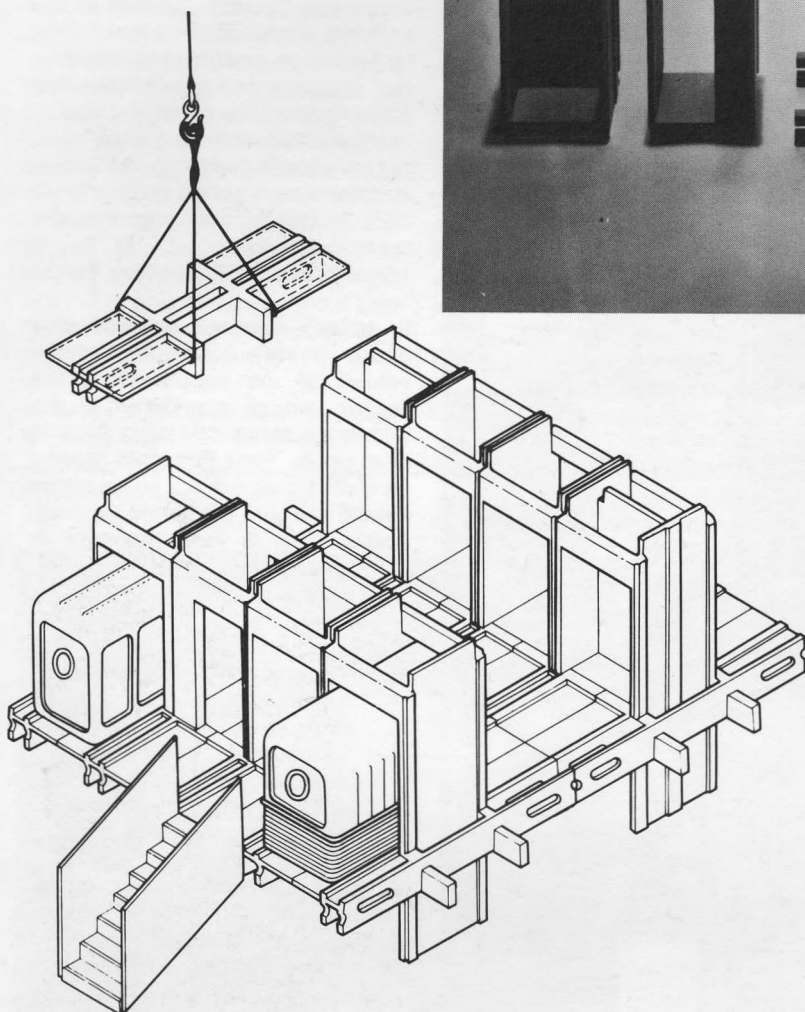
Naturally, instead of thrusting works on the people, architects should find ways of devising changing forms that cause people actually to participate in buildings. They must prepare a mechanism of change through which people can express their wishes. Prefabrication is a way to bring architecture closer to the changing form.

This design puts the equipment units around the stairwells in order to give visual expression to the energy the building receives from urban facilities and to bring about a visual sense of the different cycles of change.

The individual residential units are box-shaped affairs which act as joints.

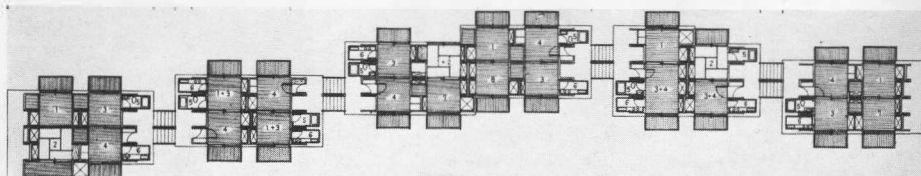
(Japan Architect, December 1967)

Structural system



Basic units

Traditional *gangyō* layout of stones in Japanese garden. Asymmetry is a basic principle in Japanese art



Plan

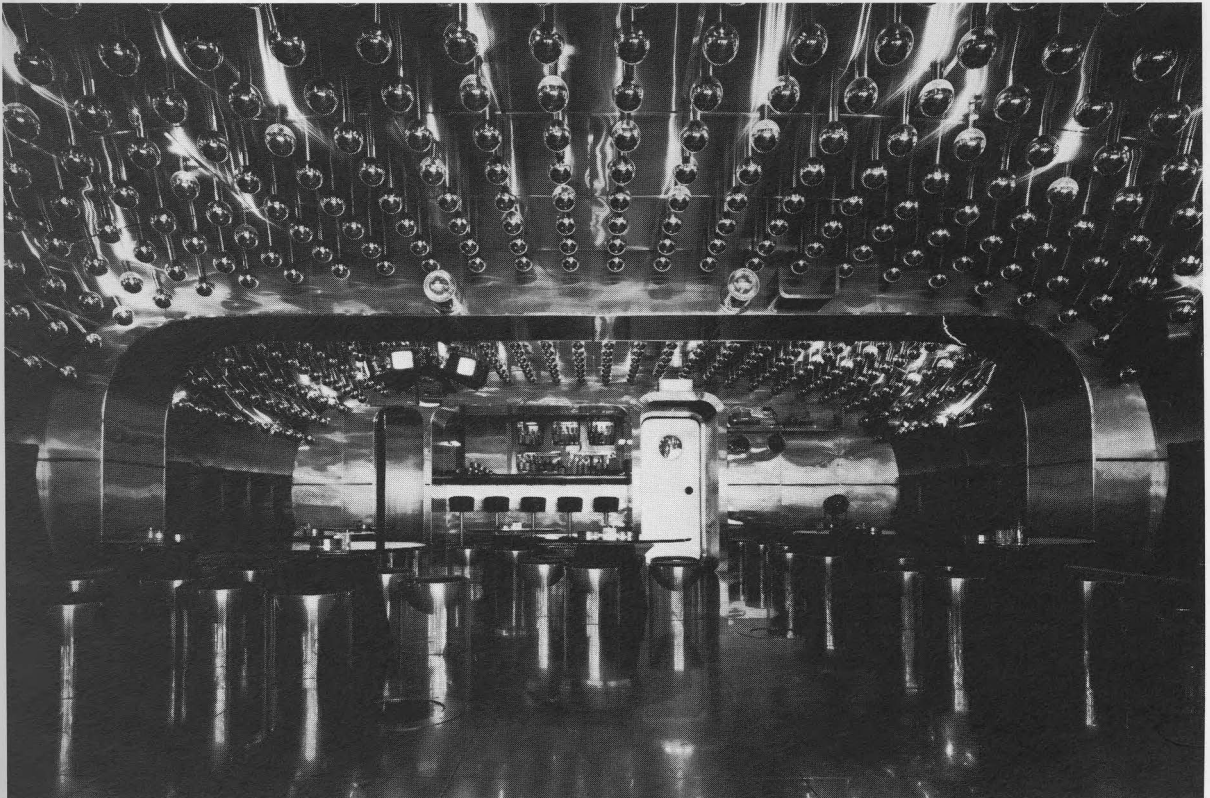
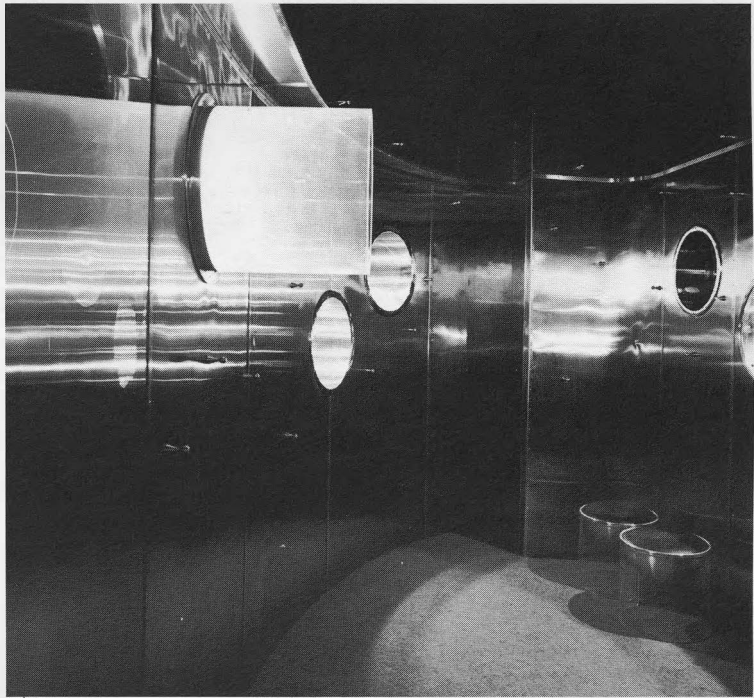
Discothèque Space Capsule, 1968

This is an underground discothèque in Roppongi, part of central Tokyo known for its night-life. Inside, the ceiling, walls, floors and all furniture are made entirely of stainless steel. Ceiling lighting, in three colours, and music, are controlled by a computer. A chandelier of television receivers, each tuned to a different programme, is suspended from above. The stage is used for fashion shows, avant-garde productions, poetry readings and other activities: the discothèque is a meeting-place for artists.

This stainless-steel space capsule is a place for the refining and smelting of information, it is a capsule for those who want to release what is pent up inside them.

Entrance

Interior. Wall, ceiling and floor are covered in stainless steel. The ceiling lights are a mini-computer



Floating Factory, 'Metabonate', 1969

96 The time is possibly approaching when there will be a demand in society for floating factories to go with floating cities. Such factories may serve the petrochemical industry, ship-building, processing of marine products or fish farms. Floating factories are of particular importance for Japan which has a very long coastline, longer for example than that of the United States, and which must exercise care not to destroy it by excessive landfill projects.

Because it is anticipated that there will be expansion, growth and replacement of factories as well as extensive recycling of resources, the Metabonate, or unit composition, will be a highly effective means of

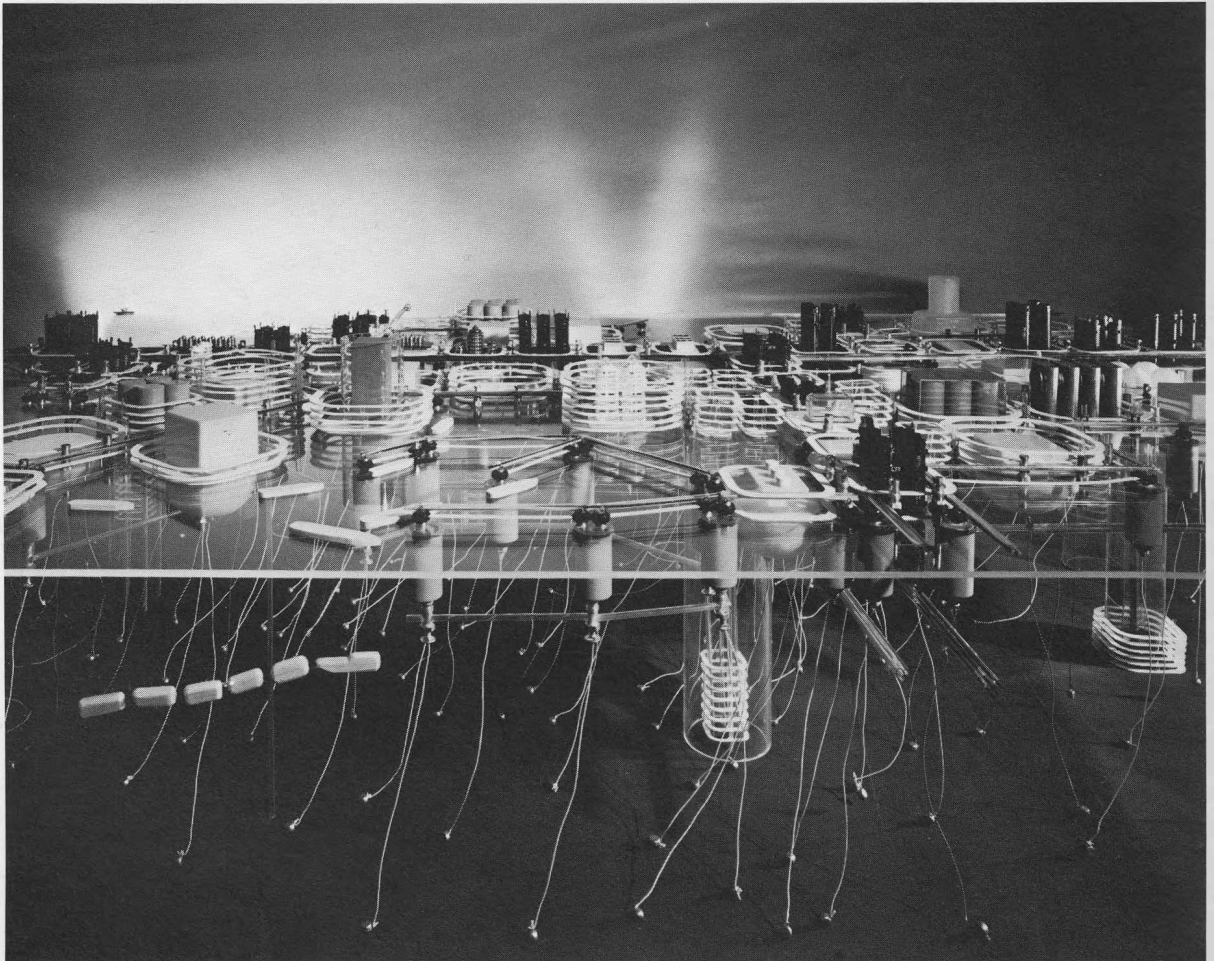
answering the needs of the metabolic cycle. Further, the use of the surface of the sea will free architecture from the land.

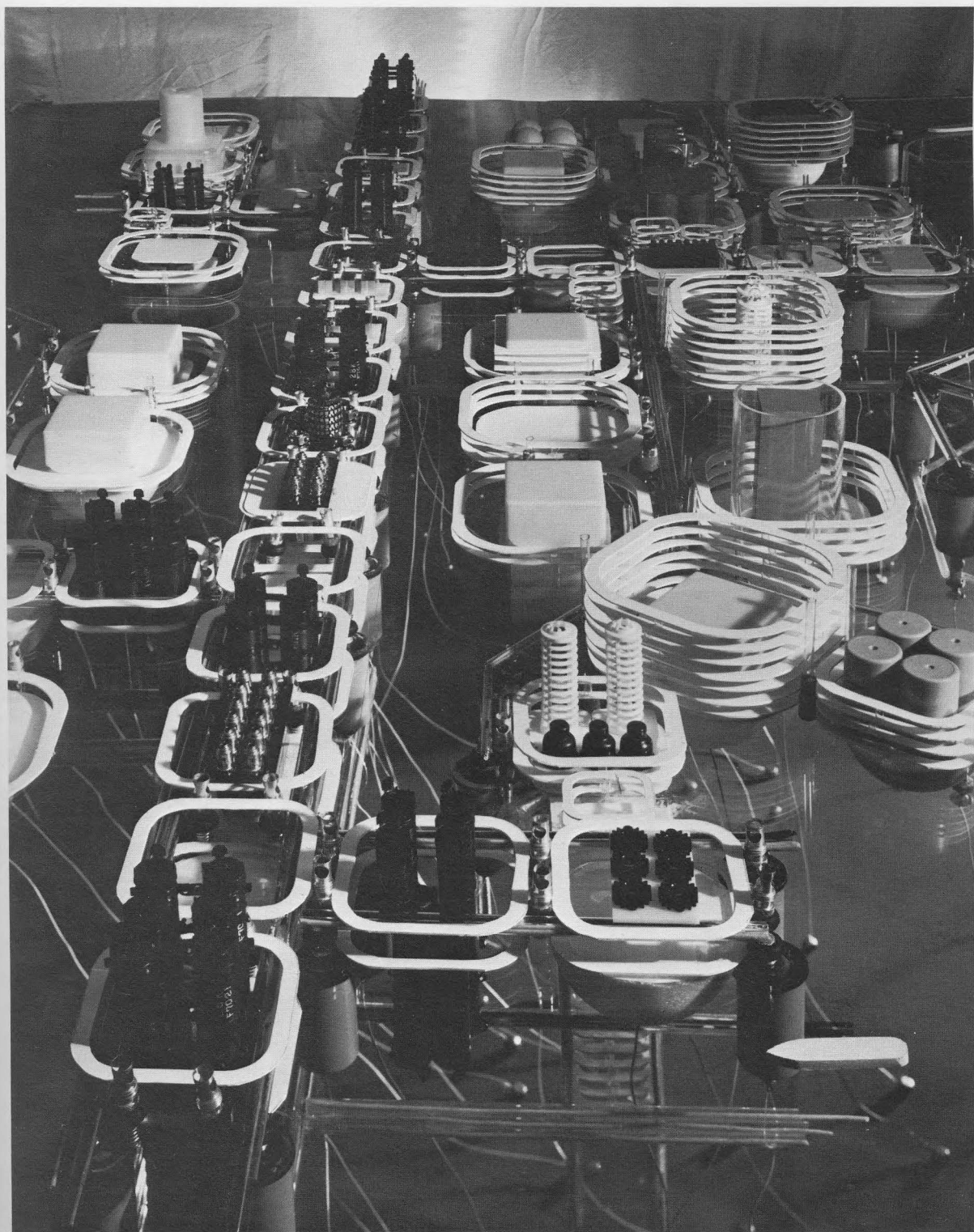
Mankind was born in the oceans, and will have to return there.

(This was commissioned by the Asahi Newspaper Publishing Co. and featured in a New Year's Day supplement in 1970.)

Aerial view of model

Section of model



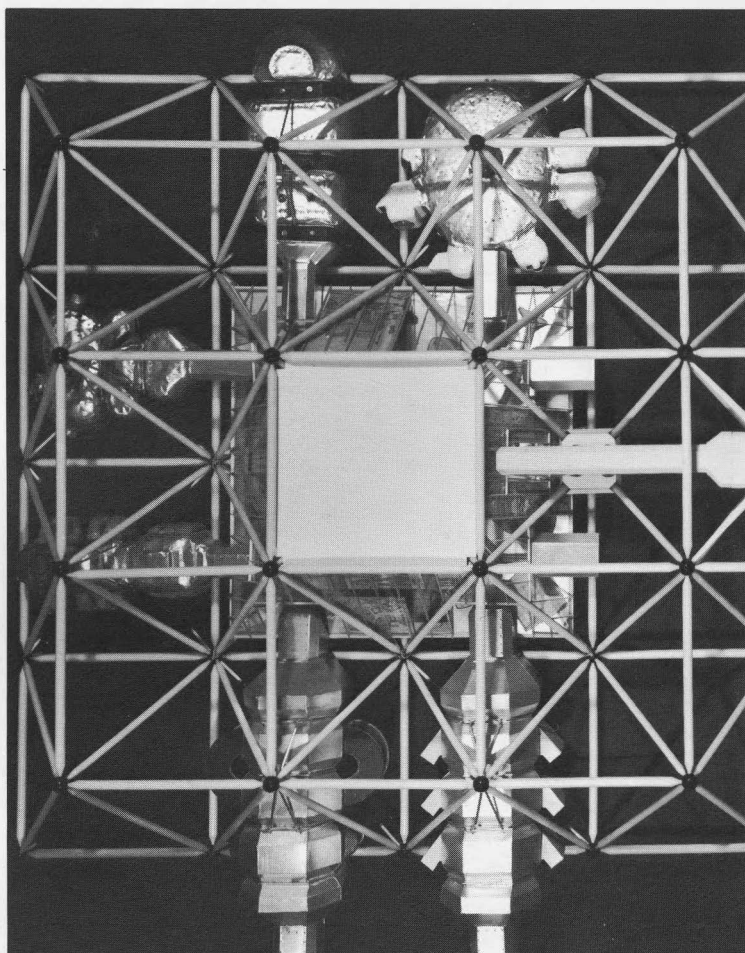
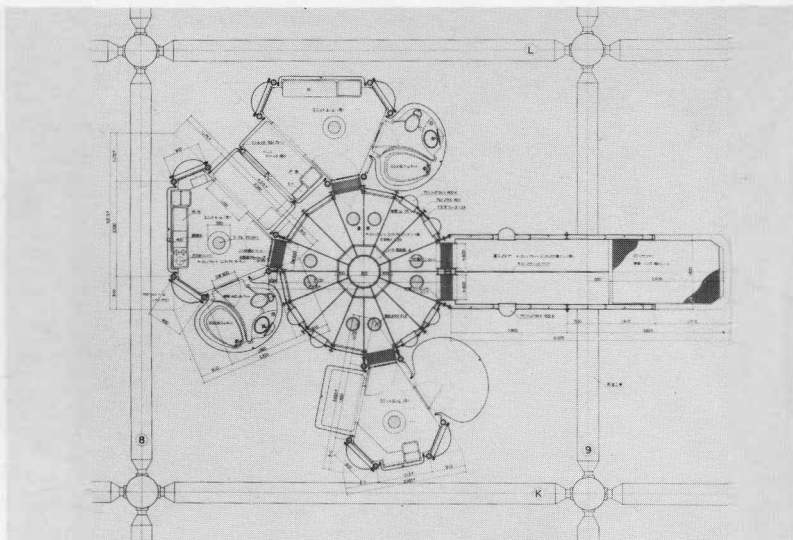


Capsule House in the Theme Pavilion, Expo '70, 1970

98 The Symbol Zone's Theme Pavilion at the Osaka World Exposition was divided into three portions. Within a space-frame suspended above the ground it was intended to depict the city of the future. Capsulized housing was its major feature.

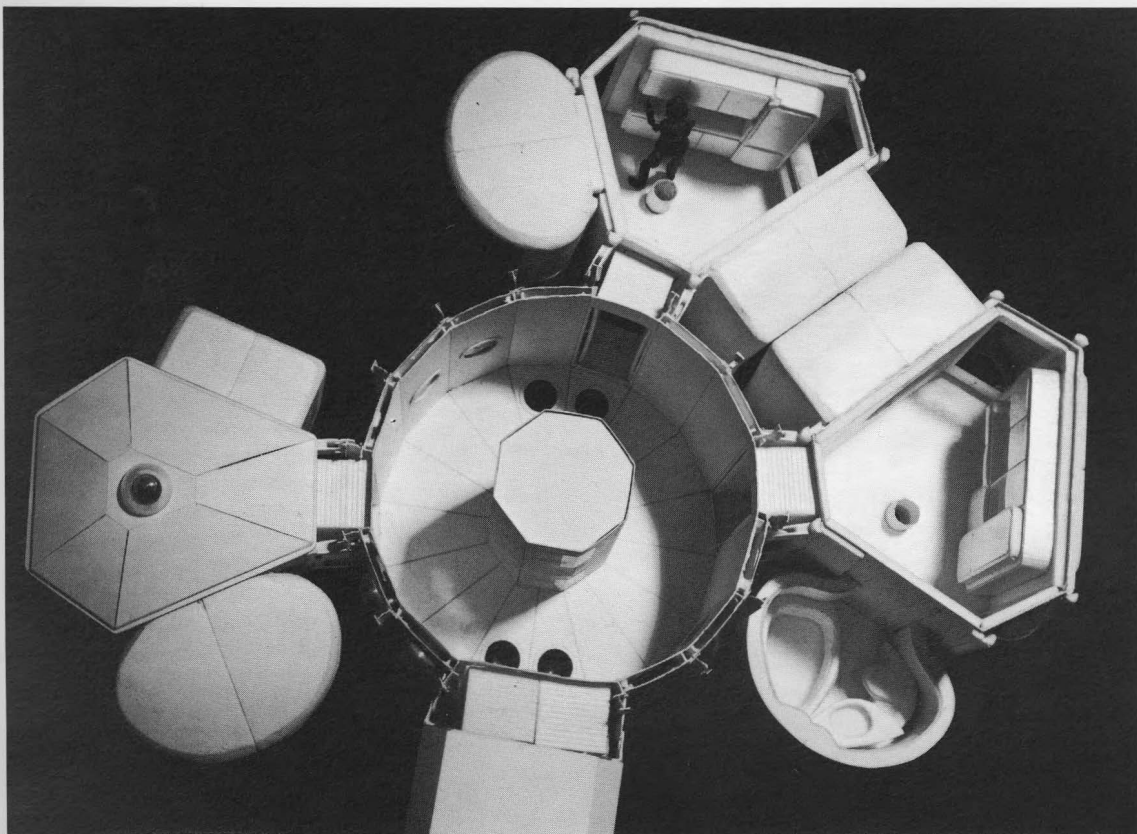
The de-organizing of architecture, de-organizing of the home – the significance of capsule housing is that it restructures architecture and the home in order to create space for the individual. The theory of the metabolic cycle is applicable to the restructuring of space, and each individual occupying a unit is completely free to have that unit reflect his or her personal needs and wishes. This is ecological architecture in that it assures a maximum usable life through replacement of portions without involving destruction of the entire work.

(The plan for capsule housing was studied as a project of high priority by the Metabolist group, and in 1969, the year before the exhibition, I published 'Capsule Declaration' in SD (Space Design) magazine. This preceded the operational use of capsule housing for the Nakagin building.)

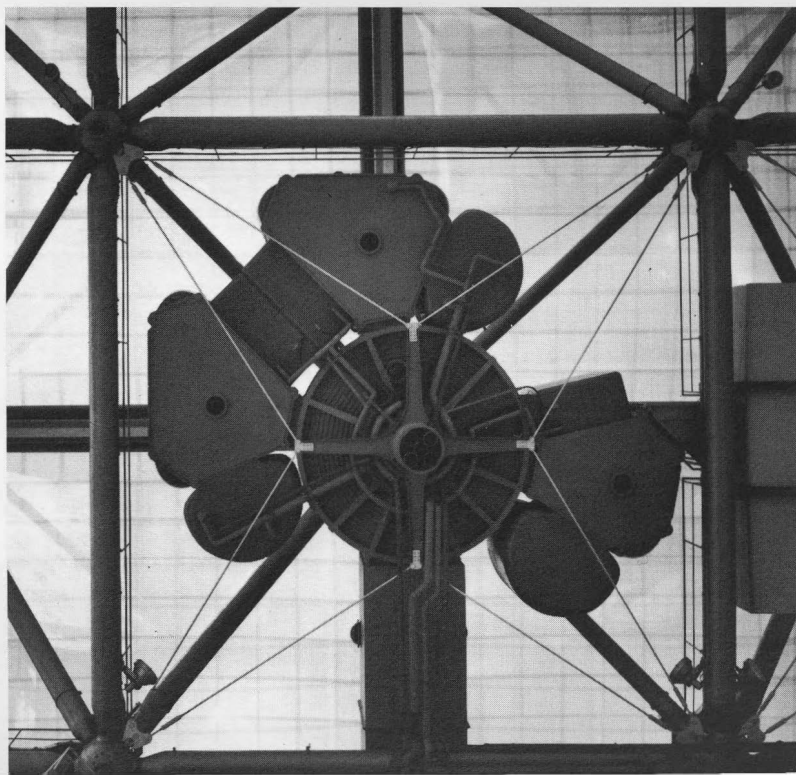


Plan

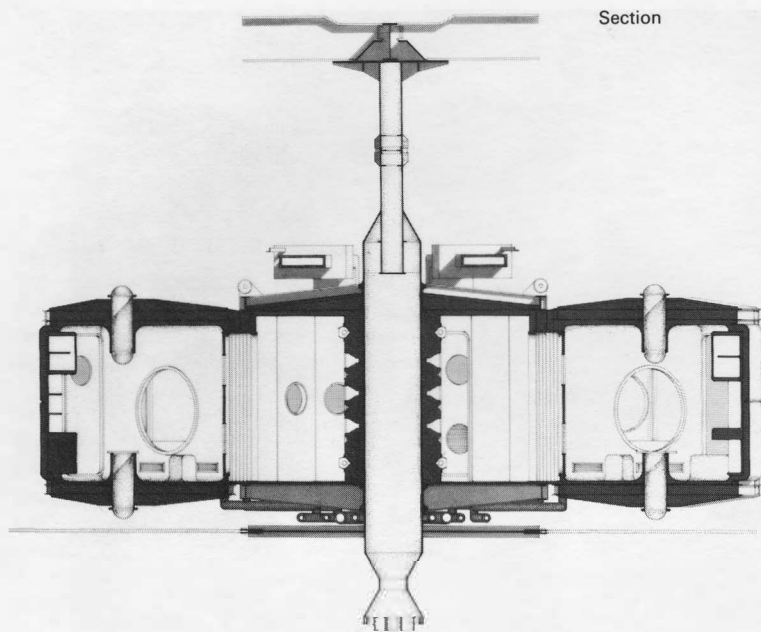
Capsule plaza at Expo '70



Model of capsule



Capsule hung from megastructure of Symbol Zone. Expo '70



Section

Interior of capsule house



Takara Beautillion, Expo '70, 1970

This pavilion was made by welding steel plates to twelve steel pipes which had been bent into 90-degree angles. The units of the structure are four types of steel of as many different strengths but all of the same scale.

Because the interior may be formed in a variety of ways by altering the arrangement of the units it was possible to experiment with a number of different forms. Capsules for exhibition use and panels for image display were placed at the interstices of this three-dimensional grid composed of interchangeable units.

Joining was by use of high-tension bolts and assembly was extremely easy to complete; only a few days were required.

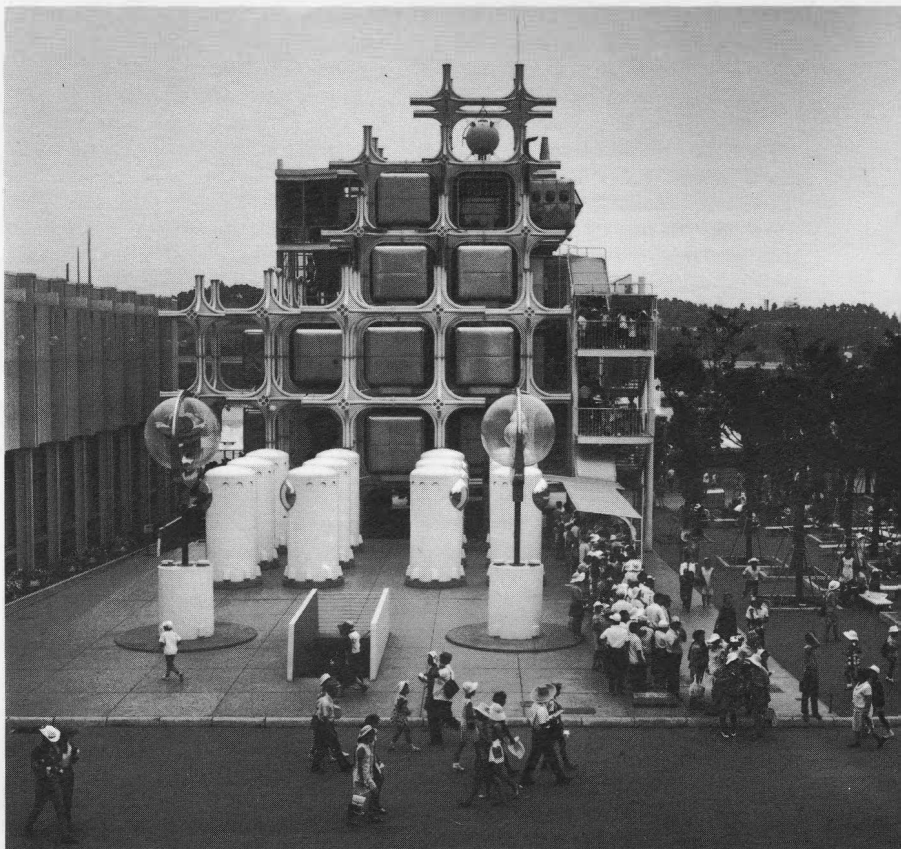
Disassembly was similarly easy to perform, and was a beautiful process. It was like the falling petals of a cherry blossom tree which suggest to the Japanese the spirit of *bushido*. In Buddhism it is considered noble to fulfil one's life and pass away beautifully, in accord with nature.

This building is a classic example of Metabolism, and one in which Japan's Buddhist aesthetics can be seen.

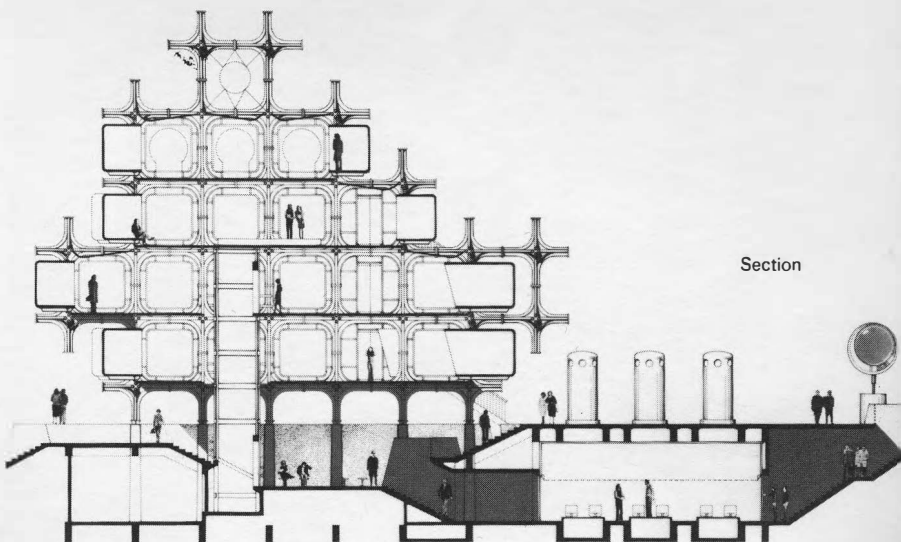
(Graphic designer Tadanori Yokoo, composer Toshi Ichihyanagi, the G.K. Industrial Design Office, and lighting designer Mikiko Ishii co-operated in producing this design. All the structural units have been retained by the Takara company, which is a leading manufacturer of chairs for beauty parlours and barber shops. In the near future this building will be reconstructed for use as a showroom.)

Robin Boyd

The most exciting piece of architecture among the almost hysterically excited company of buildings just completed or (at the time of writing) nearing completion on Osaka's Expo '70 site is not one of the national pavilions nor the biggest of the commercial ones. It is not the wildest nor even necessarily the best building (if it is fair to judge any of them before their official openings). Yet in all that surfeit of weird shapes it is the most



Façade



Section

102 compelling because it gives a glimpse, as through a glass polarized darkly, of what a building of the future might look like.

The building labours under a horrible name: 'Takara Beautillion' It is the pavilion of the Takara Group of four furniture companies, and it is the design of one of the founders of the Japanese Metabolist movement: young (36) Kisho Kurokawa. It is the best manifestation yet built of the sometimes fevered Metabolist theory – mainly qualities of growth and change.

As I write this, before opening day, the builders have long left it. But is it finished? It seems so, yet it certainly looks unfinished, and this, for a Metabolist building, is the most extravagant praise. For a first rule of

Metabolism is that a building should be capable of growth wherever and whenever required.

In this case, the structural system is based on a single prefabricated framing unit which is repeated some 200 times. Each unit is made up of 12 blunt right-angle bends of steel pipe (10 cm diameter) welded to make six arms, each consisting of four pipes grouped in a square, thus forming overall a 3-D, six pointed cross measuring 3.3 metres in each of the three dimensions. The steel is painted white.

The end of each arm is welded to a flat circular disc, like a hand, holed for bolts. When several of these units are bolted together at the discs they make up a space frame of repetitive cubes. The frame is spiked externally

by its unengaged arms, and at the extremity of each arm is one of the flat hands, waiting with its bolt-holes ready to grasp the hand of any other unit that might join it.

Floors are of precast concrete slabs, dropped into the steel frame. The whole system looks as easy and as full of fun as a toy construction kit. Yet the larger scale brought structural limitations, and Kurokawa cautiously restrained the overall shape, keeping to a fairly conservative irregular pyramid, four stories high above the concrete foundation piers. However, he could not resist adding a few unusable extra units on top, and some others, catlevered out front, just to show off the system. Free arms grope blindly in the air like a robot octopus searching for a mate.

Into the square holes of the body of the pyramid, Kurokawa has plugged at random various things designed to keep the rain out and his visitors entertained: 30 stainless steel boxes, containing exhibits, some coloured glass Pop pictures, cones, bubbles.

The whole thing may sound, so far, suspiciously like a beautifully simple concept which might result in a beautifully unified building, but there is more to come. Service pipes and ducts cannot easily be accommodated in such a trim frame system. Does that worry a Metabolist? Of course not. The services are led externally in and out the framing members and are painted in bright code colours (although it is to be noted that the publicity model displayed no service pipes). Two stairs were required. Do they embarrass Kurokawa? Evidently not. The main one, wrapped in glass, and an open escape stair are stuck on each side of the systematic frame, bearing no structural or geometrical relationship to it. They are quite big stairs. Taken together they almost compete in bulk with the building they serve. And from some aspects they threaten, along with all the



Interior of capsule in the pavilion



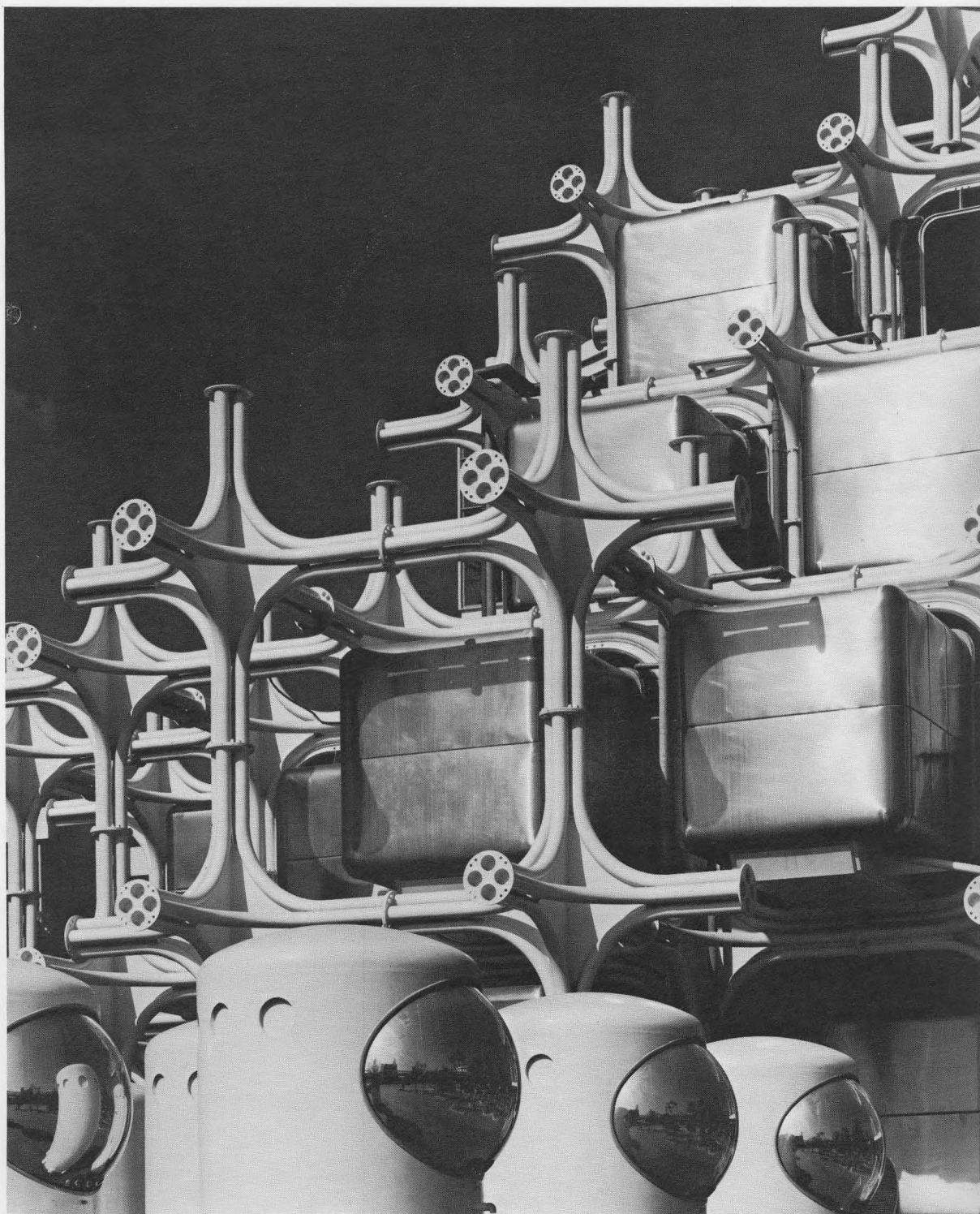
pipes and plug-ins, to destroy the architectural identity of the system. Maybe that is why it has to assert itself with empty exhibitionist extensions.

Suffocation by its own servants may be the future of architecture: a Frankensteinian end, as many have been hinting. The Takara building actually demonstrates the possibility for the first time; and demonstrations like this are among the best justifications for World Fairs. (*Forum*, March 1970)

Prefabricated units awaiting construction



Entrance hall, showing flower-shaped chairs



External view of Takara Beautillion. Photo by courtesy of *Japan Architect*

This building is not an apartment house. It was intended to provide single bedroom dwellings in the heart of Tokyo, studios for the use of businessmen living in distant suburbs of the city, or hotel space for businessmen staying in Tokyo for brief periods. Some occupants are graphic designers and artists who use their units as ateliers.

Throughout the decade before this was built the population of Japan's metropolises had been declining and in central city areas the majority of buildings are office buildings, banks and other types of commercial architecture. The number of homes there has rapidly decreased, as large numbers of people moved to outlying areas. No less than three million people travel an hour or longer to commute to work in Tokyo. It became an issue of some importance to restore housing units to the central part of the city. This building was intended as one tactical move to provide studios, an extra bedroom or a place for social activities, to some of those people who live in distant areas and commute to the centre of the city.

Utilities, interior fittings, television sets and the like were all assembled and installed at the factory and all capsules were then attached to a concrete shaft at the site. The 144 capsules were attached at the rate of five to eight a day and all work was finished in thirty days.

Each capsule was attached to the shaft by four high-tension bolts and is independently cantilevered from the shaft so that any capsule may be easily removed without affecting the others. If individual capsules are given specialized functions such as living room, bedroom, kitchen, and so on, and linked by access doors, they may be used as an ordinary dwelling.

Capsule architecture is a group form which expresses the individual. In the highly organized society of today it is of great importance to identify the individual within society.

(Capsule architecture springs from the thought expressed in Homo movens, published in 1969. The Japanese concept of housing is formed by the large amount of travel, and people who had homes in agricultural villages and worked in the cities considered their residences away from the village as temporary abodes. For modern man in our highly mobile society – for Homo movens – the capsule dwelling will probably come to be of high importance. Reference should be made to the text of the Capsule Declaration and my writings on Metabolism.)

A hotel system and sales apartment building, the Nakagin Capsule Tower Building consists of two major structural elements: two steel frame and reinforced concrete towers – one eleven and the other thirteen stories – housing elevators and equipment piping, and capsule rooms that were almost completely finished when attached to the towers. Construction processes fall into two categories: on-the-site construction of the towers and their energy-supply systems and equipment; factory production of the capsule parts and assembly of the parts. The capsules were transported to the site ready made and then attached to the tower structures.

The Ginza district of Tokyo was chosen as the site because its convenience guarantees quick sales of the rooms. The fact that most clients are visiting businessmen limited the nature of the contents of the capsules to that of a *pied-à-terre*. For that reason the designers resolved to amplify the apartment nature of the capsules by including in them moderate facilities for office work and by providing services of the kind afforded by hotels. These considerations formed the basis of the design of the individual capsules. They contain a bed and bedding, storage space for clothing, a desk for office work, a bathroom that includes all sanitary facilities, telephone, audio equipment, and such service items as

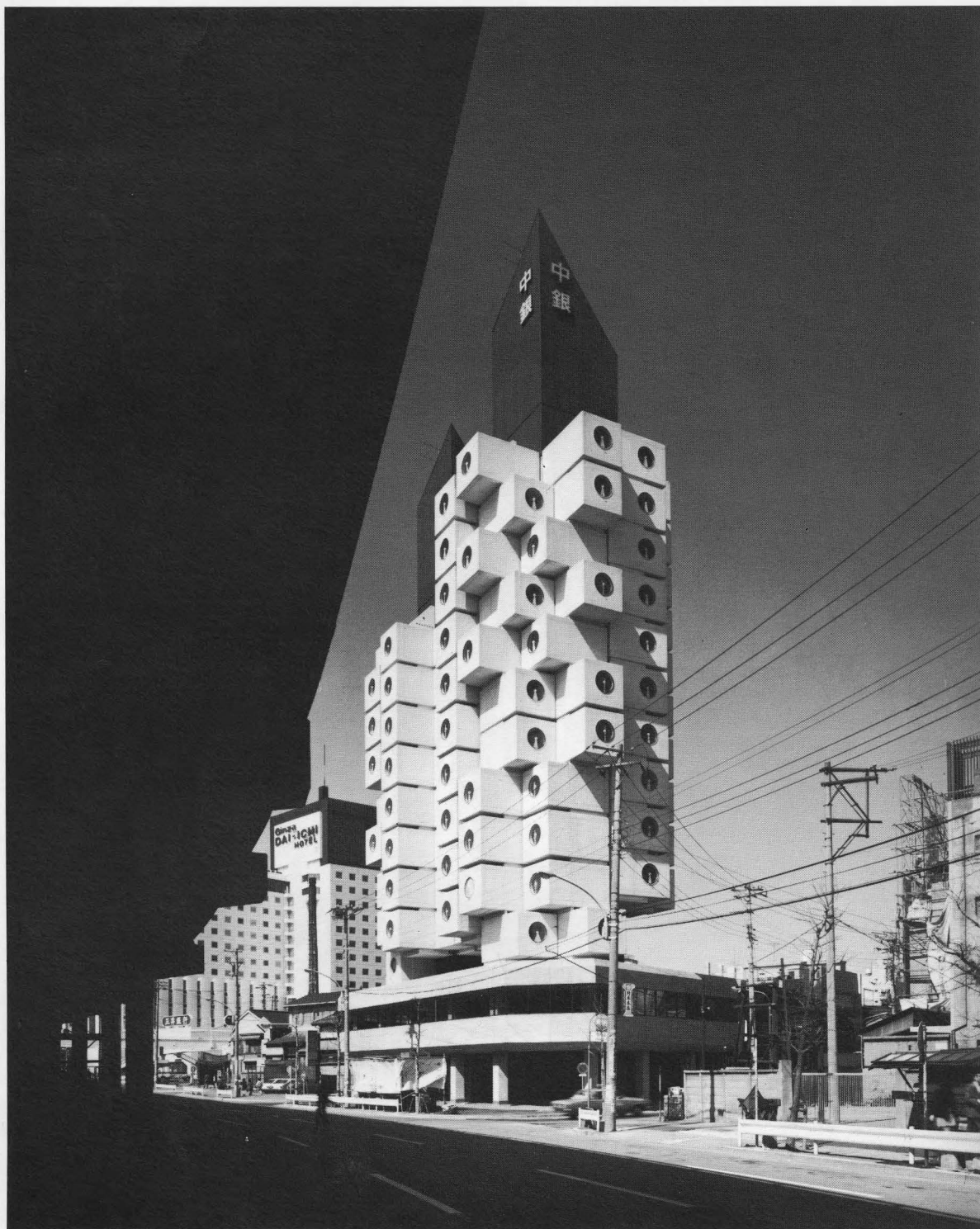
sheets, blankets, and even tooth-brushes.

Although the limited clientele more or less established the major interior and exterior natures and forms of the capsules, as a first step toward individualization of living space choice over the minor elements such as interior finishing materials, colour schemes, and some equipment is left to the purchaser. But in addition to these subordinate parts, some few distinctions are made among the capsule forms themselves. Variations of entrance and window positions produce four capsule types. Working equipment may be either on the left or the right side of the capsule; this increases the number of varieties to eight. The resulting total is eight structural bodies, two joint structures, four piping structures, eight kinds of interior décor and furnishing, and two kinds of bathroom unit. The way these parts are combined is based on considerations of economy lots of parts. Since there are only 140 capsules in the building, some of the possible variations are not used. The following is a list of the types and the numbers of each employed in the Nakagin Capsule Tower. A, B, C, and D refer to four structural types. Subnumeral 1 means that the equipment is on the left side; and subnumeral 2, that it is on the right side. Type A₁ 29, Type A₂ 26, Type B₁ 18, Type B₂ 0, Type C₁ 24, Type C₂ 31, Type D₁ 12 and Type D₂ 0. The order of installation has nothing to do with the order of type. In this instance the 140 capsules are divided into unit lots of 20 capsules each.

At the time of assembly, optional elements of the capsules were neither produced nor marketed in large quantities. Consequently some limitations were imposed on choice.

Although the combinations of interior materials are numerous, not all of them were produced.

The form of the capsule was kept as simple as possible. The major structure of the capsule is an all-welded, lightweight, steel-truss box.

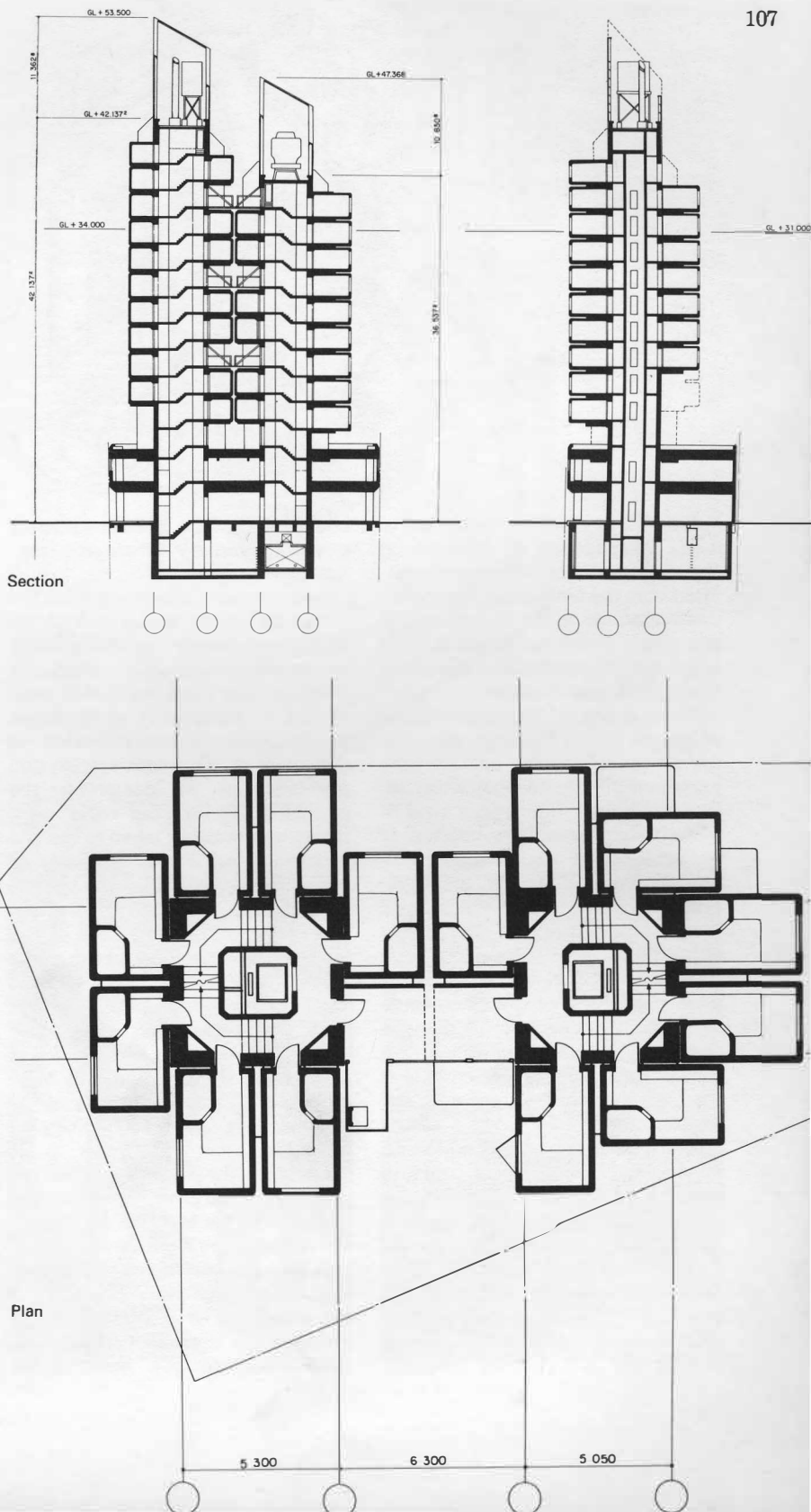


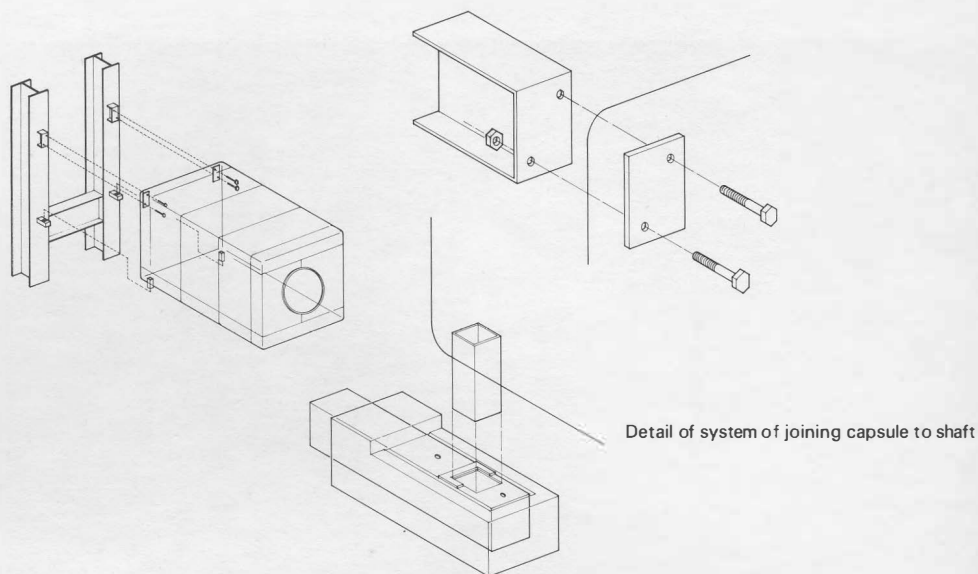
General view

All of the truss surfaces are assembled on a jig that is an improved bound and three-dimensional version of the kind of jig used in the manufacture of large shipping containers. Welding was done on the basis of this jig. The exterior is covered with galvanized, rib-reinforced steel panels. After processing, the panels were coated with rust-preventative paint, and finished with a coat of a glossy spray, Ken-itex. Because of the number of panels and the size of the factory where they were produced, their sizes were limited to a minimum (the large ones are 1.2 m by 2.3 m). For the sake of fireproofing and insulation the major structural elements were covered with a coat of spray asbestos about 45 mm thick. The exterior panel parts were covered with a 30 mm coat of the same substance.

Since each capsule is very limited in space and since all are made from the same parts, it was imperative to minimize simultaneous work processes. The parts that required different kinds of processing were to have been made at specialist factories and transported to the plant where the capsules were being assembled. But because there were many parts which used wet systems, customary methods were often employed. The furniture and bathrooms were transported to the assembly plant virtually complete. The capsules were assembled in a factory that makes shipping containers.

Because the towers to which the capsules are attached and the capsules themselves were made at two different places, the accuracy of the joint parts required careful attention. To ensure proper fits, the designers established a number of check points: 24 on the structure, 9 on the joints, 6 on the exterior panels, and 6 around the entrances. They established a tolerance margin and used only those parts that fell within permissible limits. For the structure the tolerance was from +0 to -3 mm; and for the joints ± 1 mm. Ten per cent of all welding was





submitted to a colour check and to x-ray investigation. In addition, at the time the capsules were dispatched from the factory and when they were attached to the towers on the site, their interiors, exteriors, and equipment were checked at roughly thirty places per capsule.

These shafts are the primary place of access to the building, the containers for equipment, and the core on which the capsules are attached. In short, they amount to a kind of artificial-land base. They are made of a steel-frame and reinforced-concrete, rigid-frame structure. From the basement to the second floor ordinary concrete is used, but above these levels lightweight concrete is used. Shuttering consisted of large panels the height of a single storey of the tower. In order to make use of the staircase possible at the earliest stage, precast concrete was used in the floor plates and the elevator shafts. By using a policy whereby steel-frame work was done for two days and precast-concrete work on the two following days the designers were able to prepare a completely operational staircase by the time the frame-work was finished. Construction of the elevators on the site was shortened by incorporating the three-dimensional frames, the rails, anchor indicator

boxes, etc., in the precast-concrete elements and by employing prefabricated cages.

Requirements stemming from the life cycle of the building and the changing nature of the needs of the users made it necessary to divide the building into three main elements: capsules, equipment, and tower shafts. Similar considerations led the designers to use a rack system and prefabrication in designing the plumbing. These pipe racks were tested before being taken to the site for installation. The units consist of channels and flat bars (zinc plated) for six pipes for water, hot water, cold water, and drains. Each unit is long enough to serve about three stories. Ventilation pipes are not needed with solvent plumbing systems. Since this system has rarely been used in Japan, the proposed version for this building was submitted to the Abe Laboratory of the Shibaura Institute of Technology for testing.

Because the capsules were attached from the lower levels first, the lower joints are invisible and working spaces there were very cramped. This problem was solved by directing stress to the walls only on the lower reaches of the building and allowing the upper parts to handle axial stress and pull. Bolts in the

upper parts of the building are high-tensile, $\phi 25 \times 4$. Their torque values were tested with a torque wrench.

Joints in both upper and lower zones are embedded in lightweight concrete for fire-resistance and durability. In the top levels concrete was poured in place in rubber forms; in the lower zone mortar-filled, precast-concrete pieces were used. Actual-size and smaller model pieces were examined comparatively to test strength.

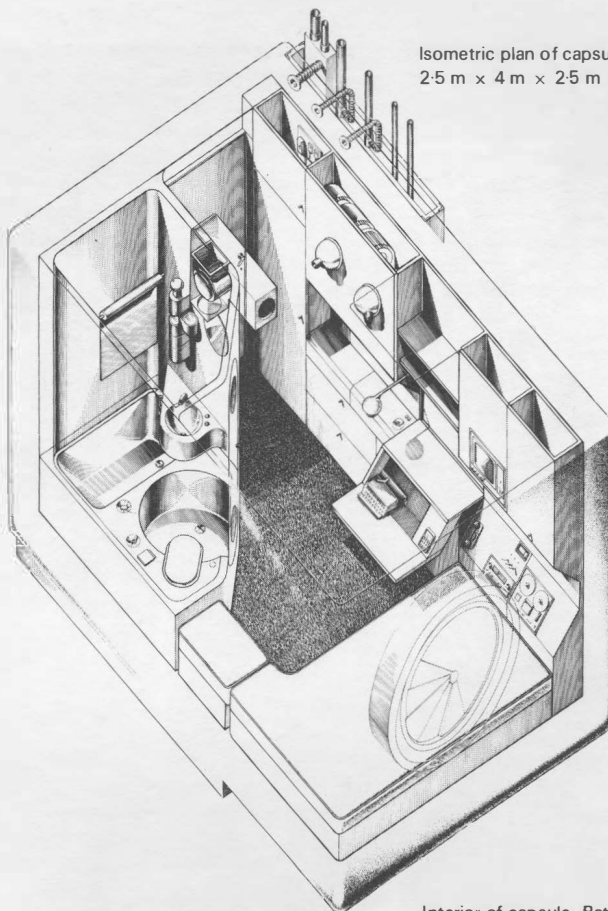
Plumbing units are connected to capsule equipment by flexible tubes about one metre long. Part of the floor of the capsule may be opened for joining, spot checks, and repairs, the position of the bathroom had to be re-examined because the capsules contain built-in furniture and other furnishing that must be moved to allow workmen to open the floor for repair.

Because large trucks are banned from the streets of Tokyo at certain times the capsules were dispatched from the plant at which they were made, carried to a stopover point, and then redispached along an express highway so as to reach the city at a suitable hour. Workmen at the site prepared brackets for the following day's load of capsules. This process began every morning at six o'clock.

The problem of transportation plagues every project until the very end with prefabricated and capsule units. The many difficulties that must be solved include the amount of equipment investment devoted to the plant and the plant's location, transport routes, times, stockyards, legal restrictions on rolling stock, traffic laws, restrictions on times when large trucks may travel through certain districts, handling of parts, and many others. Unfortunately, designers have had no conclusive theory about how to handle these problems. In this instance the capsules were produced in a factory 450 kilometres away from Tokyo. Clearly this posed a serious transport problem. Furthermore, because the site of the building is very cramped, there was almost no stockyard space. This meant that every day just enough capsules to fill a day's installation work could be brought to Tokyo.

This building not only satisfies legal requirements on disaster prevention, but also provides extra escape routes in excess of the legal stipulations. In order to produce this disaster prevention the designers worked in cooperation with the Hoshino Laboratory. The plan evolved as a consequence of this research consists of a series of stages. First is the maximum amount of preventative care to see that fire does not break out. Second is detection of fire, warning, and careful leading of residents from danger zones to safety. After plotting clear escape methods, the plan considers extinguishing a fire and rescuing anyone who might be trapped. Taking advantage of the fact that the building is two separate towers, the designers were able to increase the freedom of choice of escape route. The two staircases are separate, though an outdoor bridge connects them at one point. In preparing this plan, consideration was made of the number of people in the building, the number of staff members, and analyses of the way people act when escaping from a disaster.

(*Japan Architect*, October 1972)

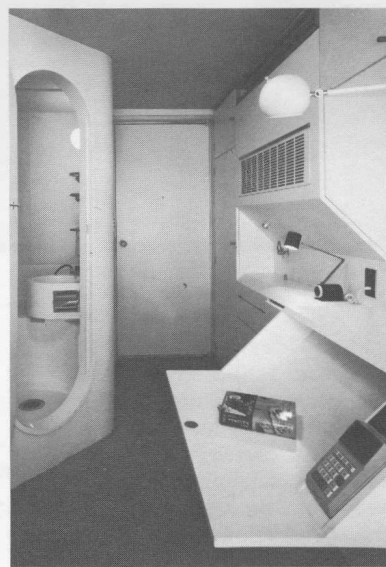


Isometric plan of capsule. Dimensions are 2.5 m x 4 m x 2.5 m

Capsules are attached in two different directions



Interior of capsule. Bath unit, air conditioner, TV, radio, tape recorder and furniture are provided in the factory





General view

Yasuo Uesaka

If Kenzo Tange represented those architects who introduced western architecture with western technology to Japan, then Kisho Kurokawa represents the new generation of Japanese architects that is trying to reintroduce a Japanese architecture with western tech-

nology. This is not to say that Tange and the others have not drawn on Japanese tradition. They used the tradition very effectively in their treatment of details. The point is that they did not use the Japanese vocabulary in the composition of spaces.

The spatial compositions produced by Tange and others have

been, in fact, western. Every element worked to create one, final heroic space and monumentality. There is a definite hierarchy in these compositions that manipulates the volumes to lead to one space. For example, in Tange's major works, such as his Olympic halls and St Mary's Cathedral (Tokyo), one finds a

single interior space formed by hard surfaces — a classic western space.

Historically, Japanese architecture has no tradition of creating a single major space or a single monumental structure. One can even say that there have been no Japanese spaces formed by four hard walls. The concept of enclosed space in the western sense did not exist in Japanese architecture. The Katsura Detached Palace, for example, consists of a series of attached structures of similar size and strength facing an even more elaborate garden. Interior spaces do not overwhelm a visitor with soaring hard walls. The buildings in the garden are just a small part of the total landscape.

The subject of Japanese paintings is never a building, the surrounding nature is important, not the buildings. This is not the case in the West where a single cathedral makes a worthy subject for an artist. This difference in painting is not mere accident. There is a distinct difference in attitudes between East and West towards the man-made structure and nature. Western man has always looked at himself as the master of his fate and at nature as a supplier of materials for him. Eastern man has seen himself as a part of nature and natural processes.

In architecture, these different attitudes seem to dominate what men have created. Most western cities are closed off from nature and individual buildings in them are powerful, while Japanese cities are surrounded by mountains and the individual buildings are open. In the West the formal spaces were always arranged in a strong hierarchical

order, in which the major and the minor spaces and their relationships were clearly defined. Such hierarchical order of structures and spaces gives a sense of power, a sense of finality. In contrast to this concept of hierarchy and the complementary concept of Christian dualism, there is in Honen's Buddhism no sharp distinction between heaven and hell or good and evil, nor is there a hierarchy of Cartesian rationalism. Honen stresses the simultaneous existence of good and evil in one being.

Kurokawa thinks Buddhist. Therefore his philosophy is highly contradictory when viewed with Western logic, orderliness and priority. He has written seventeen books so far on topics ranging from futurology, urban design, metabolism, mobile man, and action architecture, to the information society. Whether one reads his writings or talks with him, one theme comes through very strongly again and again a concept of incompleteness; growth and change with intuitive wholeness; not a theme of academic precision or logic. Kurokawa's philosophy is in direct contrast to western ideas of determinism and inevitability.

The concept of metabolism is nothing but a sense of impermanence. To Kurokawa, what makes up this universe is a multitude of selves called *jiga*, which are linked by means of accidental encountering called *en*. Translated into English, *jiga* means will, self, cell, living component; Kurokawa calls it *capsule*. *En* means *media*, where encountering or intercommunication takes place. The world is then a

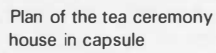
juxtaposition of free wills, co-existing sometimes in harmony and sometimes in conflict through *en*.

Kurokawa's notion of the capsule is not one of parts; the capsule is a self-sufficient component like a living cell, a functioning entity, a meaningful space unit with its own life cycle. It lives and dies, but the *en* is always there to take on new cells. Likewise, his capsules may be moved or destroyed to make room for new capsules. Constant change, in terms of time and space, is the law of the universe called metabolism.

At first glance Kurokawa's work looks unfinished. However, one can detect a trace of the eastern landscape, which is not formal, not hierarchical, unstructured, and often conflicting. To understand Kurokawa one needs a different criterion from the traditional western concept of space. Kurokawa's potential lies in his awareness of change and understanding of his time, in which a multitude of forces coexist.

He is more of a philosopher than an artist. He is unconcerned with details in his buildings. Consequently, his buildings seem at times unintelligible, uneven in detail, and discordant in proportion.

It is important to note that the new breed of leading Japanese architects is predisposed to face the changing world with a broad-minded, all-embracing attitude, which may not allow them to control the basics which can then shape their physical environment. The champion of these 'Metabolist' architects in contemporary Japan is Kisho Kurokawa. (*Architecture Plus*, January 1974)





View from north



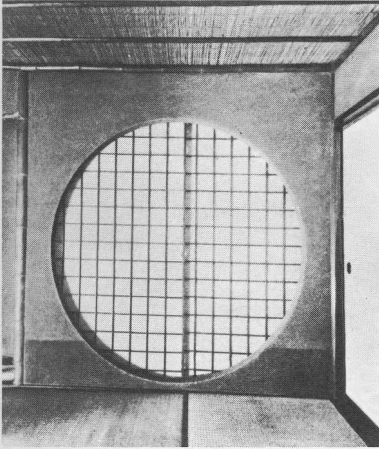
In the Nakagin Capsule Tower the capsules were single bedrooms and the building is more of a hotel than a residential structure. In this Capsule House the same sort of capsule as was used for the Nakagin tower was used but given specialized functions, as a kitchen, bedrooms (two capsules) and teahouse which are interconnected by a central reinforced concrete living space. The building is a summer house.

The site slopes steeply and because of the variation in natural conditions a concrete shaft was made so that the roof could be used for parking. The capsules are attached by the same high-tension bolts as used for the Nakagin Tower and are cantilevered in the same way. The interior of the capsule used as a teahouse follows a plan made by Kobori Enshu, one of Japan's greatest tea-masters who lived in the sixteenth century.

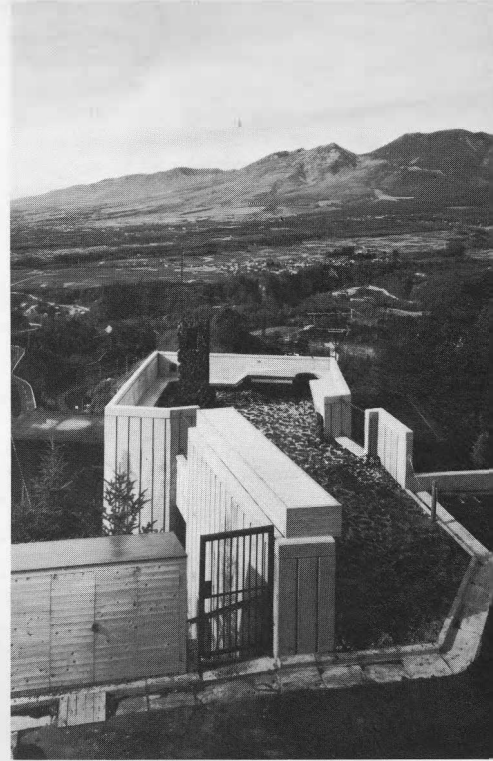
The 2.5 m by 4 m dimensions of the capsule are exactly the same as those of the traditional teahouse. The round windows are copies of a window design used in traditional teahouses but are produced by modern industrial methods.



View from below



Detail of a traditional tea ceremony house



Roof and entrance



Living room

Concrete Capsule House, 1975

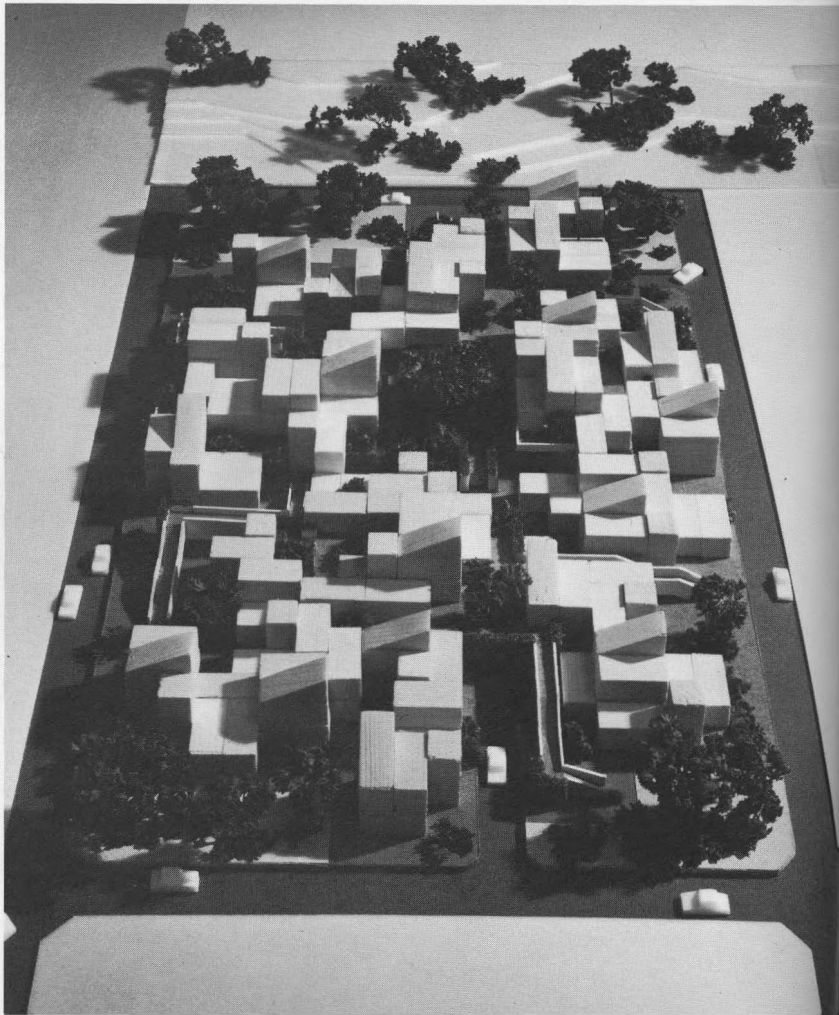
116 This is a concrete capsule house which is being used as part of an on-going experiment. The units, 3 m by 6 m, are made very quickly by a special method of moulding in of concrete. The joints are bolt joints. The building may be extended to the height of three stories. The roof may be either flat or sloping depending on local climatic conditions.

Unit + Unit + = city

This is part of an experiment to determine whether this equation is valid.

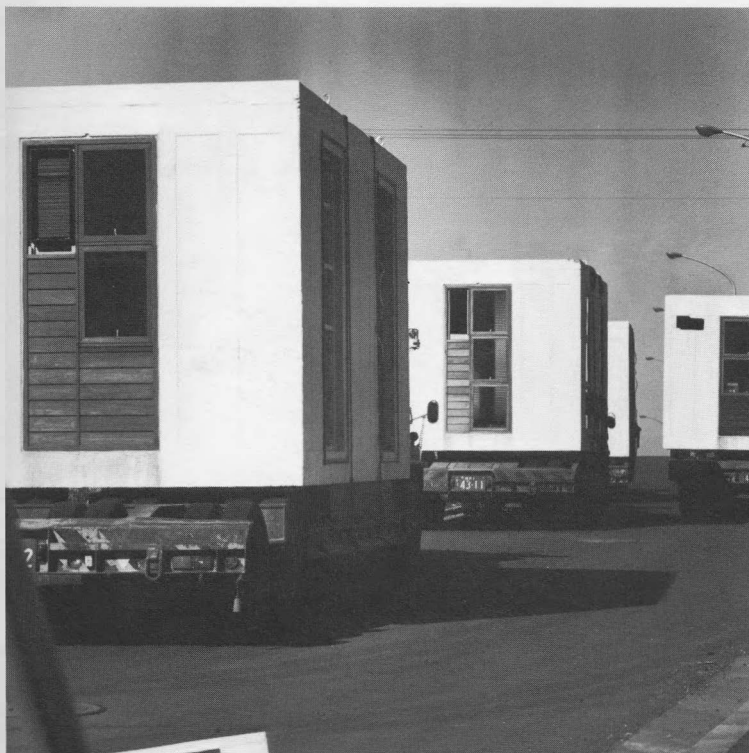


Plan for a town house



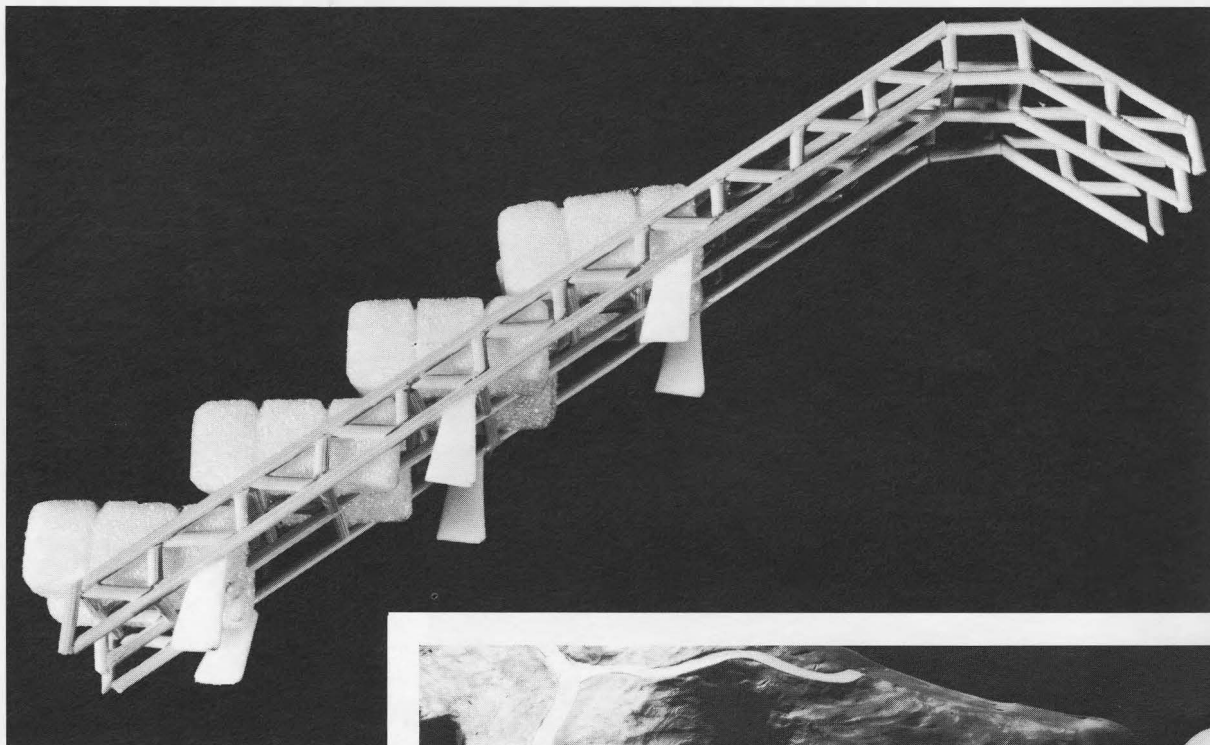
Housing sector composed of concrete capsules

Concrete capsules ($3\text{ m} \times 3\text{ m} \times 6\text{ m}$)
transported by trailer trucks



Experimental construction of concrete capsule

Capsule Village, 1972

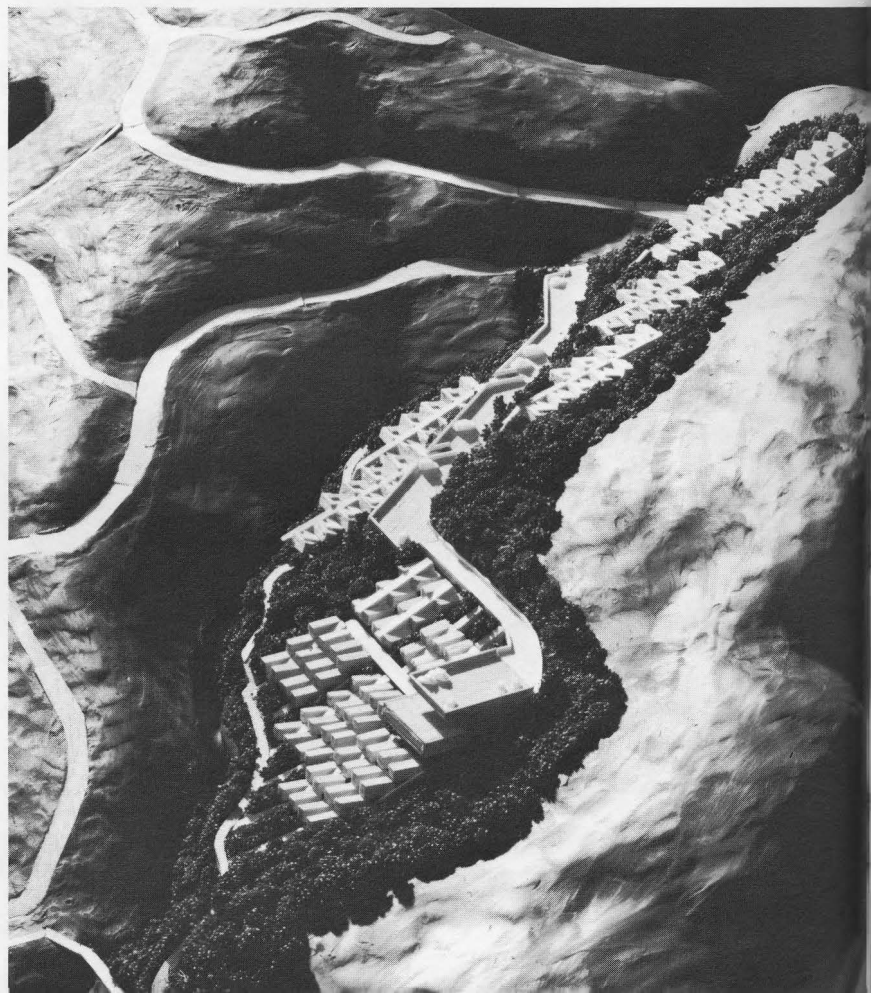


A pipe-structure was built in order to protect the plant life on the sloping portion of the site. A capsule was then fixed by joints, on the bridge, for use as a summer house.

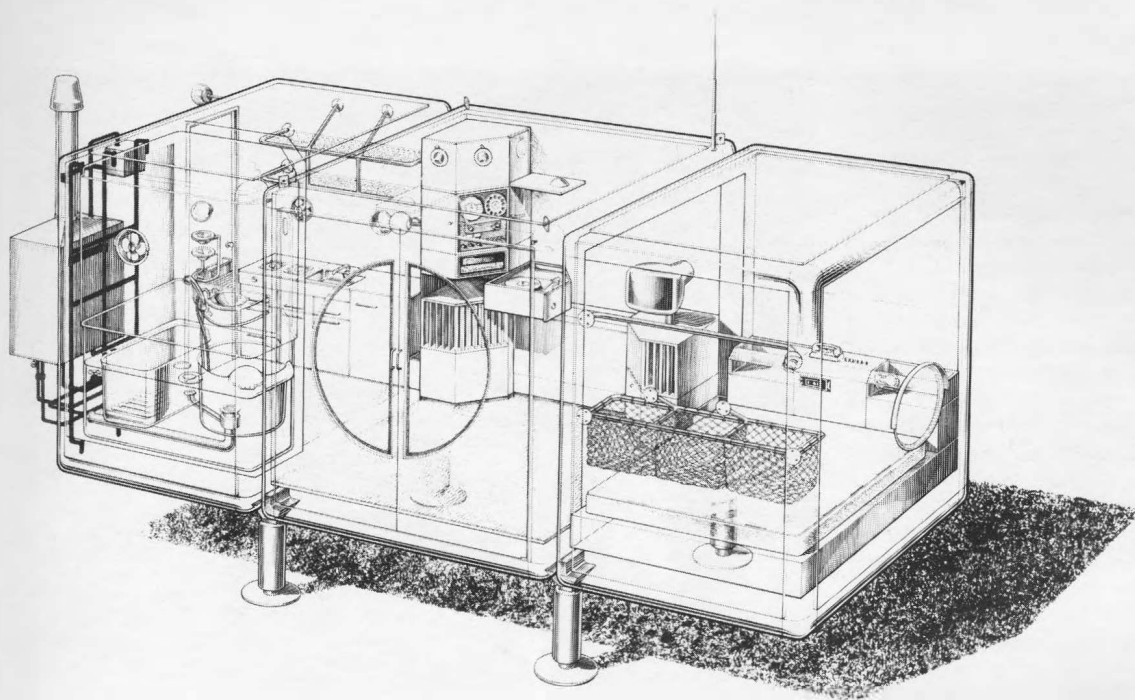
Ducts for power lines and water and drainage pipes are attached to the staircase which serves as the approach to the bridge.

This capsule is 3 m by 6 m and is somewhat larger than those used in the Nakagin Capsule Tower. The capsule is divided into three sections: a mechanical section which contains the kitchen, toilet and fuel centre, a living section, and a sleeping section. The dimensions and interior finish of each section are different from those of the others and ample range of choice was provided for the owner.

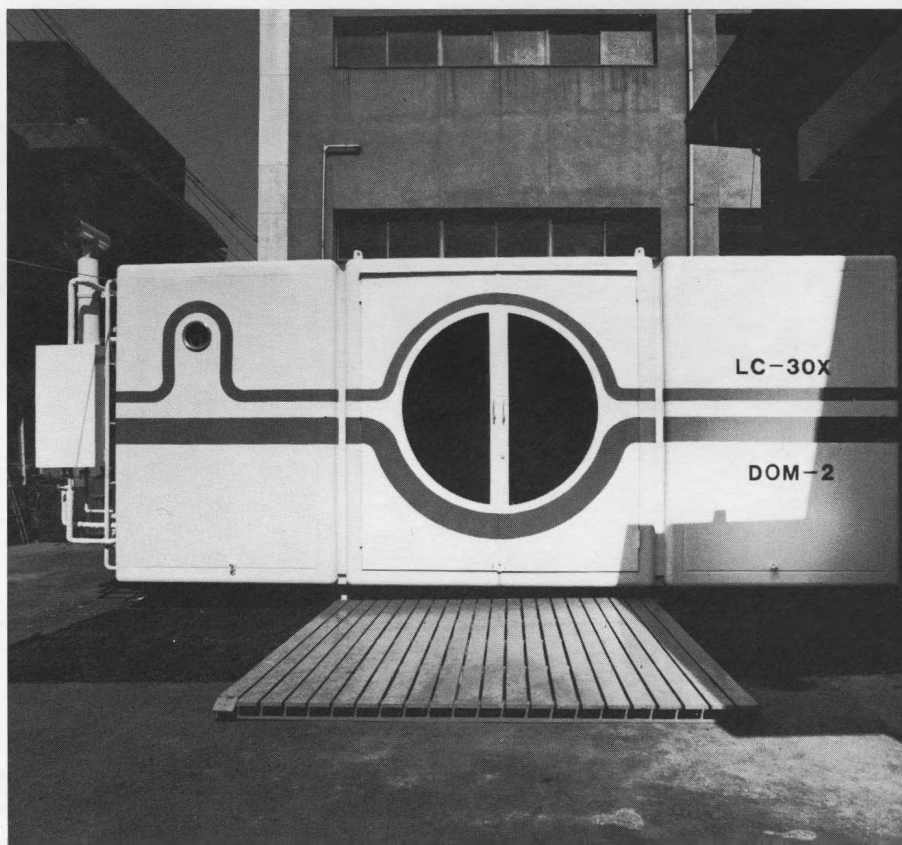
Model showing how capsules are attached to latticed beam structure with minimum disturbance of the natural landscape



Aerial view



Capsule in three sections



Capsule composed of three different sections

Sony Tower, Osaka, 1975

120

This building is located at the access point to Osaka's busiest commercial and entertainment centre, Shin-saibashi. So that it would stand out as a gateway to the district it was made as high as permitted by law.

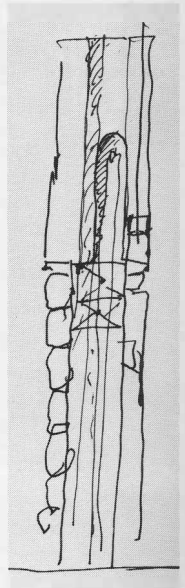
Because the building is also a showroom for Sony products it is important that it can accommodate a heavy flow of visitors. Visitors using the building may see the street and its activities as they move up and down in the building by looking through the glass barrier which separates the elevators and escalators from the outside. Architecture in which the people inside can see what people outside are doing re-discovers communication between the exterior and interior.

Sony has the image of being a communications developer, and this building is an 'information tree' which embodies all the information of its urban surroundings.

Capsules the same as those used for the Nakagin Capsule Tower are used for the building's toilets; they are faced with stainless steel on the exterior. The escalators and elevators are also thought of as capsules, which carry people from the outside to the exhibition spaces.

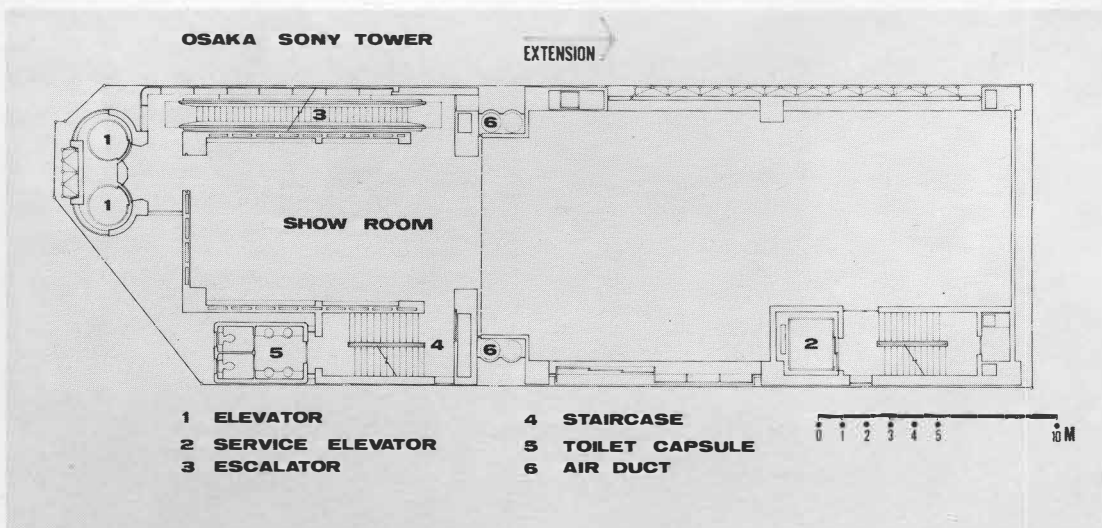


Detail of side



Sketch

Plan





View

Koito Building, 1974

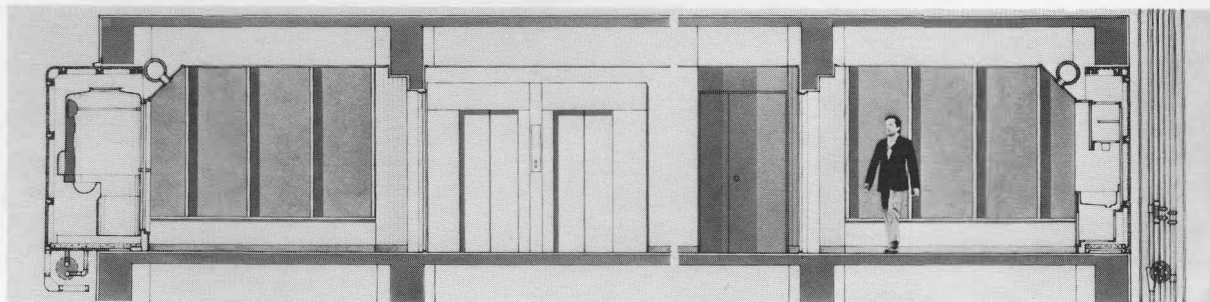
122 Capsules are used here for an office building. Because this office is in use twenty-four hours a day, bath units and air conditioning units are installed on every floor and are independently controlled in each space unit.

The capsules for the bath units and air-conditioning units were prepared at a factory and attached to the building. Piping (for water, drains, gas, etc.) was also connected at the factory and is exposed on the exterior of the building.

Entrance



Section of typical floor



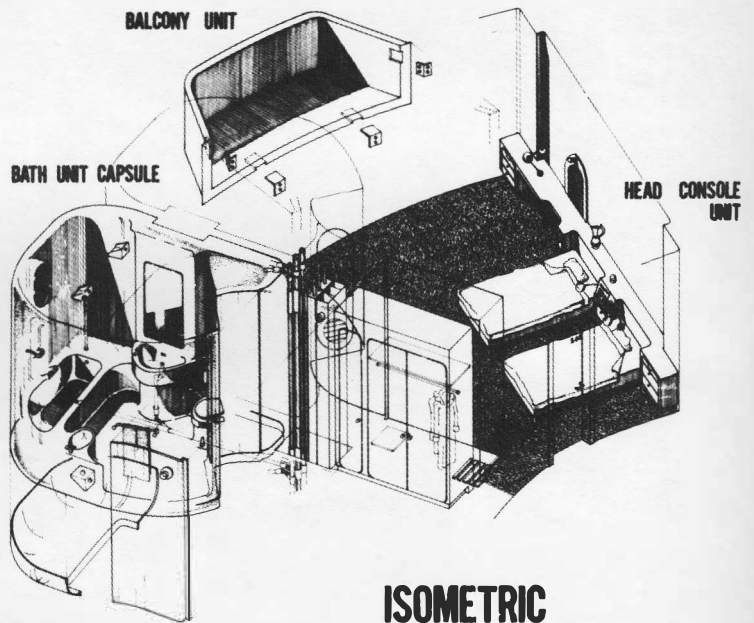
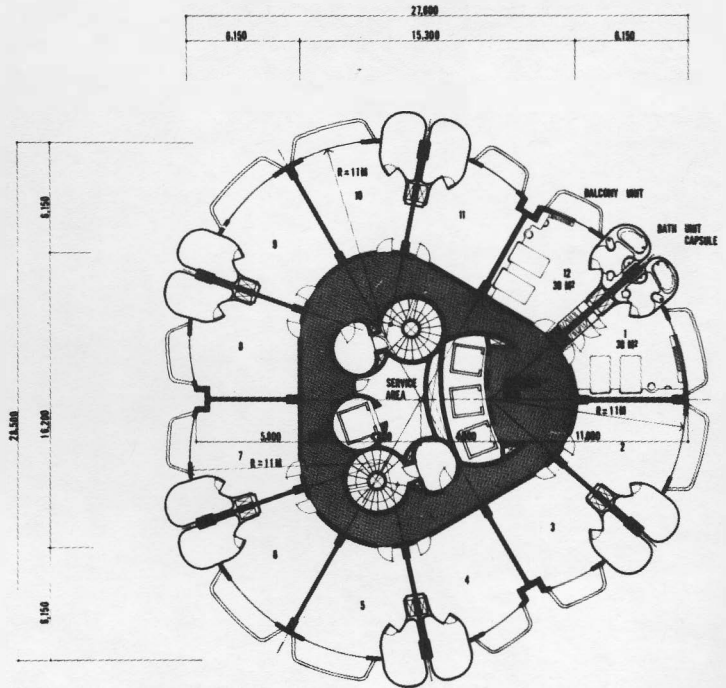


General view

Um Al-Kanhazeer Project, 1975

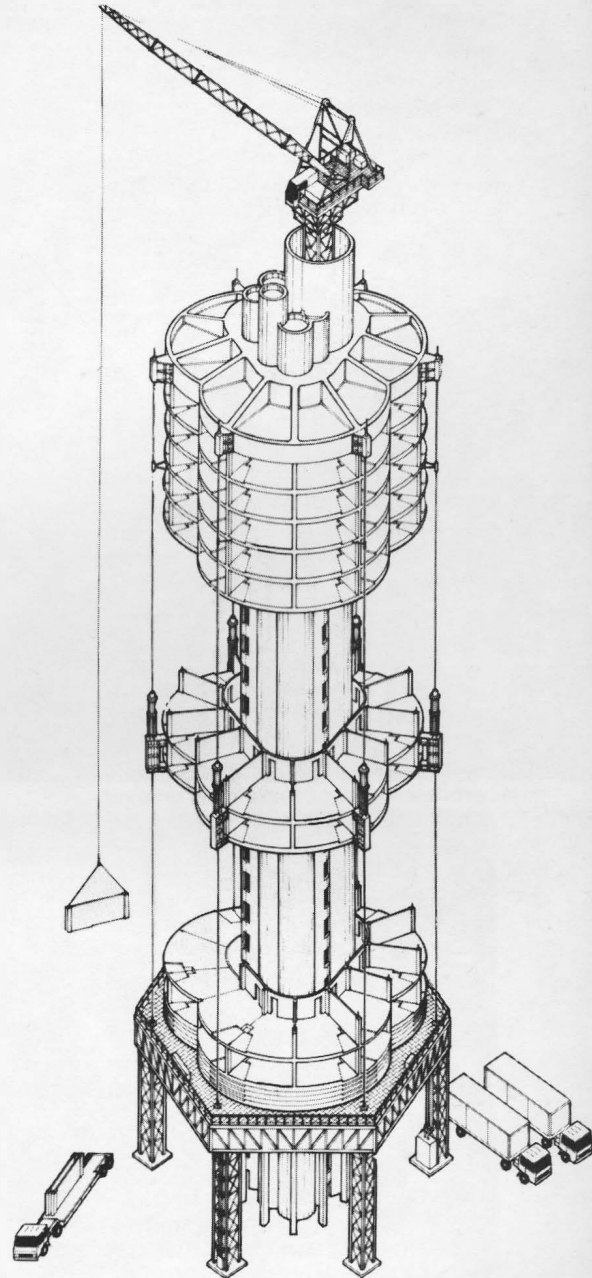
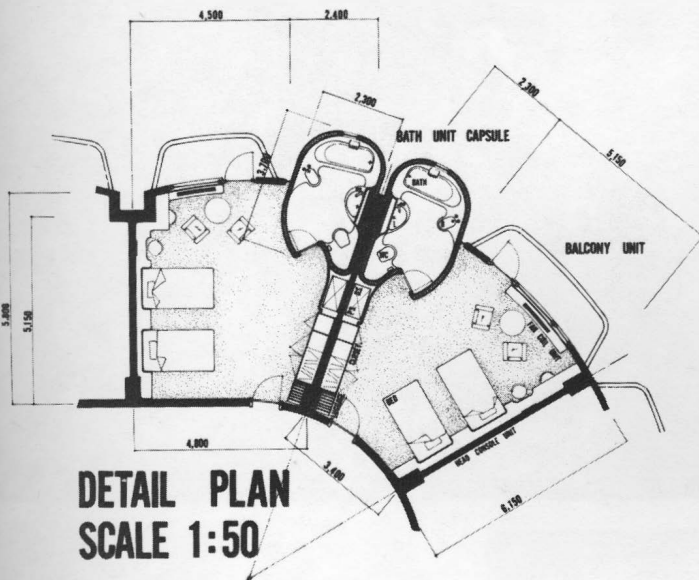
124 This project incorporates an international conference hall, casino, hotel, shopping centre and sports area.

The high-rise portion of the hotel would be erected by the build-up method and bath units attached in the form of capsules. Because these units would be attached from the outside they could be replaced at any time in the future.



ISOMETRIC

Plan and isometric drawing of capsule



Construction method

Drive-In Restaurant, 'Otome Toge', 1969

126

A space-frame and megastructure were made by the use of pipes. So as to use the roof of the restaurant a substructure was provided to which tents could be easily affixed. The roof slab is suspended from the joining portion of the upper frame.

The joints and frames which were used to make the space-frame were processed in a factory and assembled on site. Future growth of the building may easily be achieved by adding more frames.

The space-frame, different from rigid box-type architecture, has permeable volume. The boundary where architectural space ends is not easily drawn. This is in the tradition of ambivalent volume in Japanese architecture.

As might be expected, the primary concern in planning was to keep the cost of the space-frame as low as possible in relationship to total costs. At the same time this called for extreme accuracy in the joints.

Actually more accurately described as a space-guide, the frame consists of steel poles (600 mm ϕ , 750 mm long) factory-welded in twelve directions.

The other main structural members include the lower diagonal and horizontal pipes ($\phi 267.4$ mm by 6.6 m) and the ones in the upper sections ($\phi 216.3$ m \times 5.8 m), both factory-processed. All of these were erected on the site to form quadrangular pyramids.

During construction the ends of the frame-guide elements were fastened temporarily in place with bolts and carefully adjusted before welding began. Because of the high level of technical proficiency of the factory welders, there were much fewer angle and directional discrepancies in the frame than we had anticipated, and the amount of clearance in the bolt holes was sufficient to give the entire frame correct alignment.

In addition, there was no need to rely on accuracy in bolt diameters, since the distances from the bolt holes to the ends of the pipes and the angles of those pipes were enough for on-site adjustments.

Furthermore, because the success of the joints in the framework depended more on the general technical skill of the steel workers than on the more sophisticated – therefore more expensive – skills of other workmen, the system adopted here helped economize on erection costs.

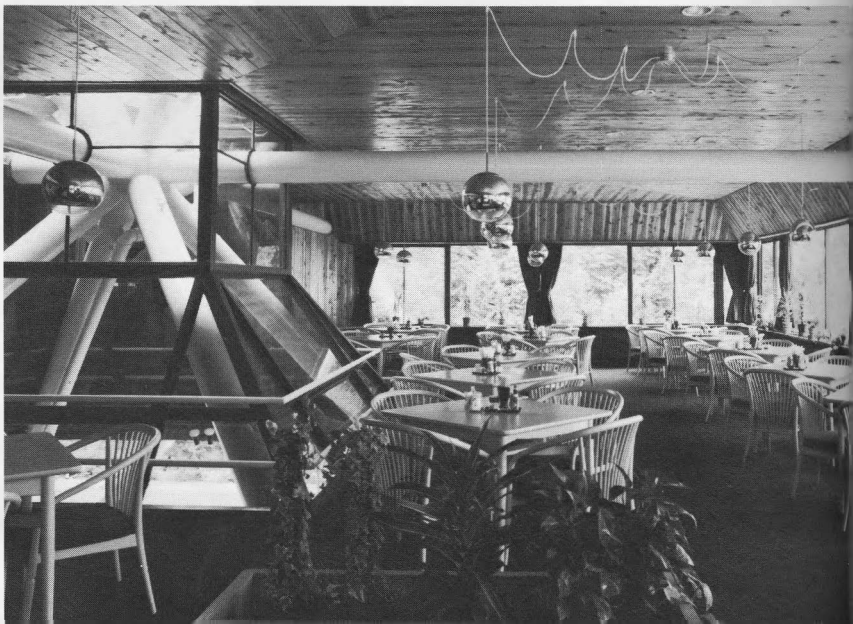
Floor girders for the restaurant and beams for the roof rest on the space frame, but the latter are reinforced by steel pipes (4–32) suspended in four places from the top of the space frame.

(*Japan Architect*, December 1969)



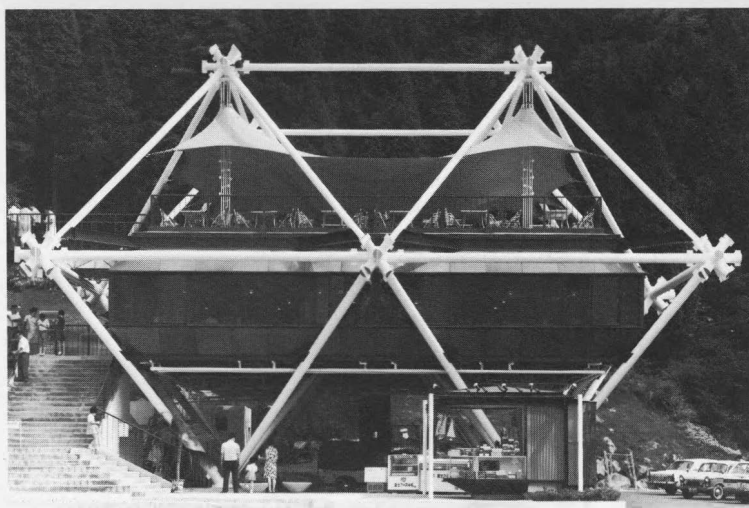
Detail of a joint

Interior





Aerial view



Façade

Toshiba Ihi Pavilion, Expo '70, 1970

128 A space-frame based on tetrahedron units was used, in keeping with Metabolism's breaking down of architecture into its constituent units and restructuring them to form a whole. It is possible to create a virtually unlimited number of forms because this tetra-space-frame is capable of growth in fourteen directions according to a system of three-dimensional coordinates.

Four types of units were prepared for this building, each of different strength, by cutting the ends of six welded steel plates to the curves at the edges of tetra-units of the same scale. Suspending the roof of the theatre from this frame, the strength of the entire frame had to be able to withstand winds of typhoon force. Structural calculations were done with the aid of a computer, which determined the locations of the three-dimensional coordinates and the places where units would be used.

When industrialization broke past its end-point (omega-point) the surprising result was that something quite baroque had been produced.

The theme of this pavilion was 'Forests, the sun, and man' Civilization was born from the forest. Perhaps a forest of steel heralds the arrival of the end-point of civilization. But beyond the end of civilization I see yet another forest.

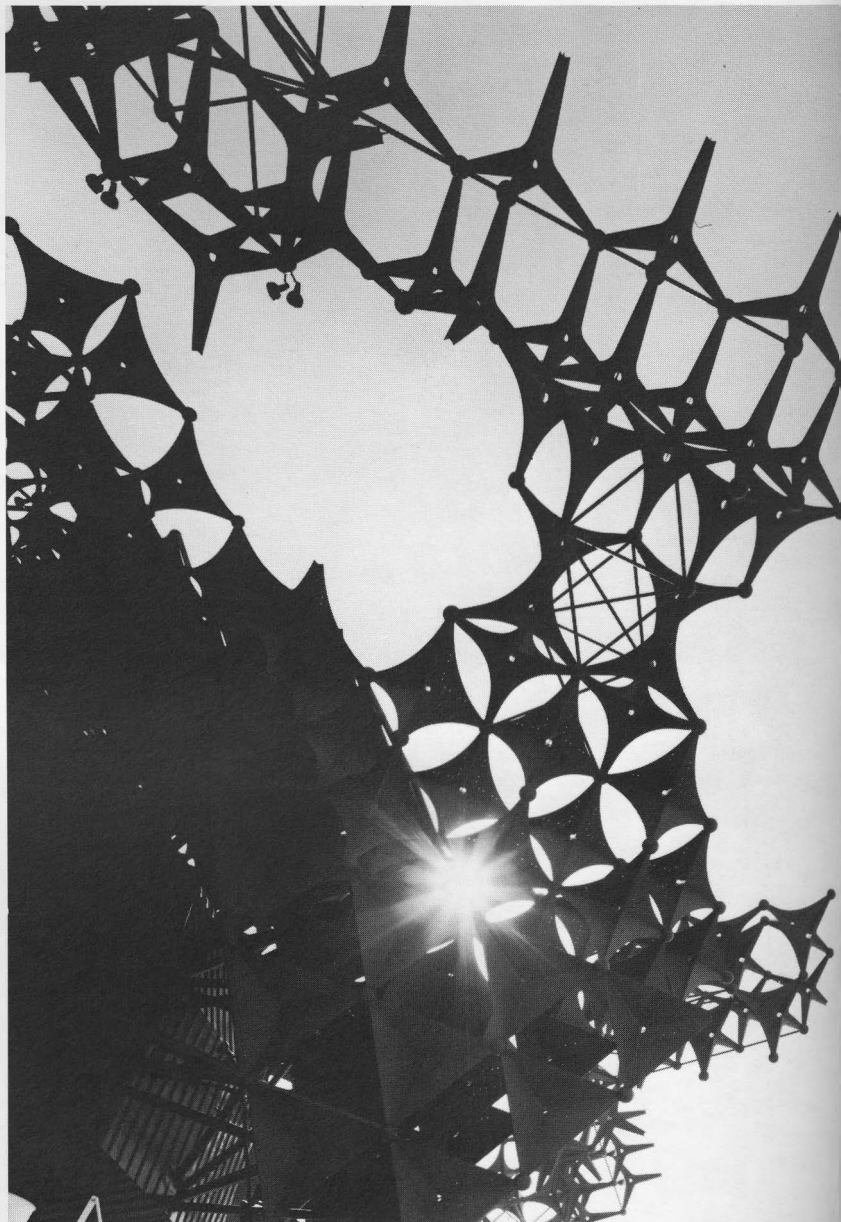
(This building was intended for use over a period of only six months, the duration of the exhibition. After the exhibition closed the building was easily taken down and the steel was sent back to the furnace so that it could be recycled for other uses.)

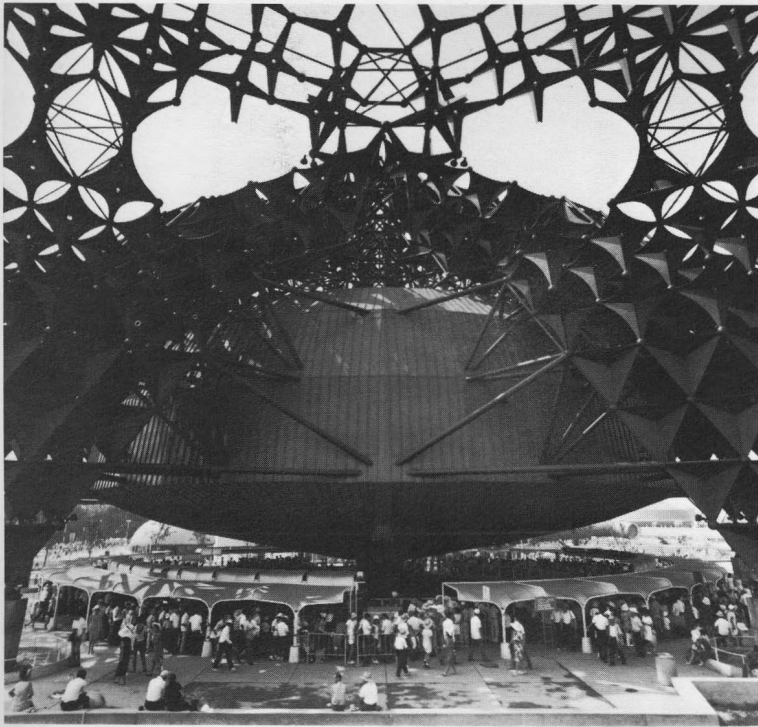
A dynamic space-frame composed of 1,444 tetra-units rises above a spacious pedestal with ramps. The global-vision theatre (external diameter 40 m, arena diameter 26 m, seating capacity 500 people) is suspended within the space-frame. The theatre weighs 300 tons. The seats arranged in concentric circles rise and lower once a minute by means of a 670-horsepower device. The motion picture image is the

central element in the planning, and the building and its theme are unified through the space-frame, global vision theatre and rising and revolving seats.

(Japan Architect, June 1968)

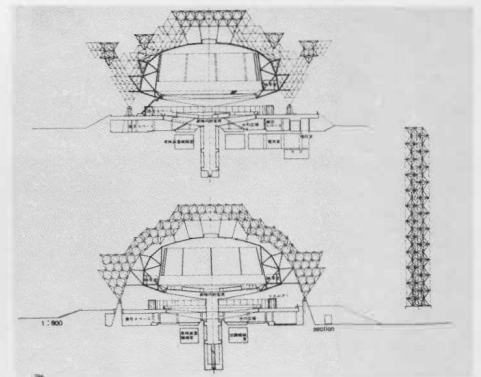
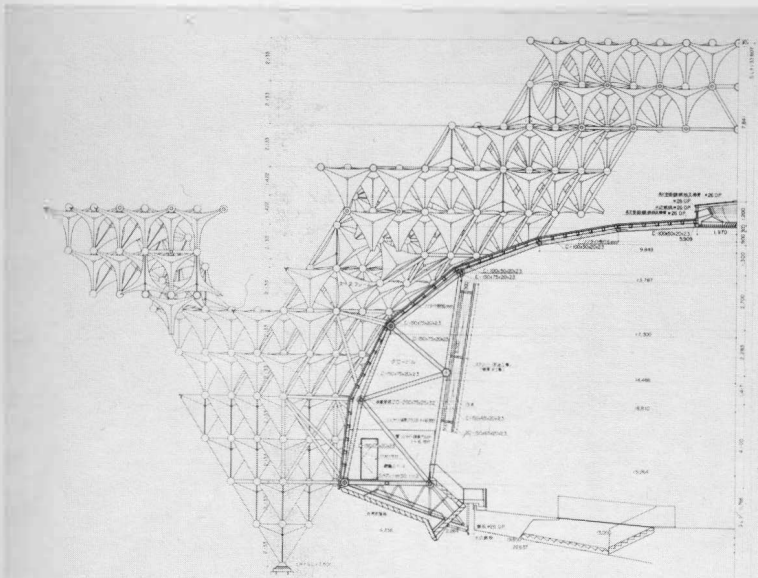
Detail of space-frame



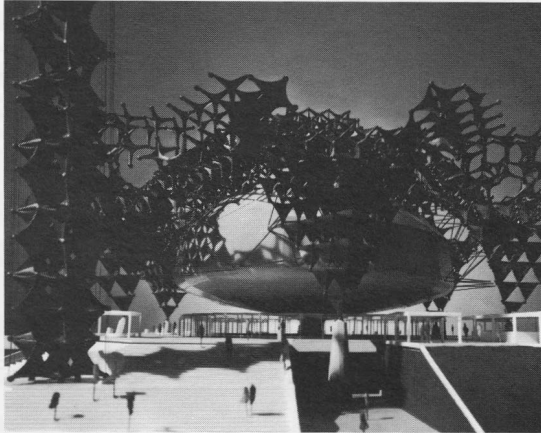


Theatre suspended from space-frame

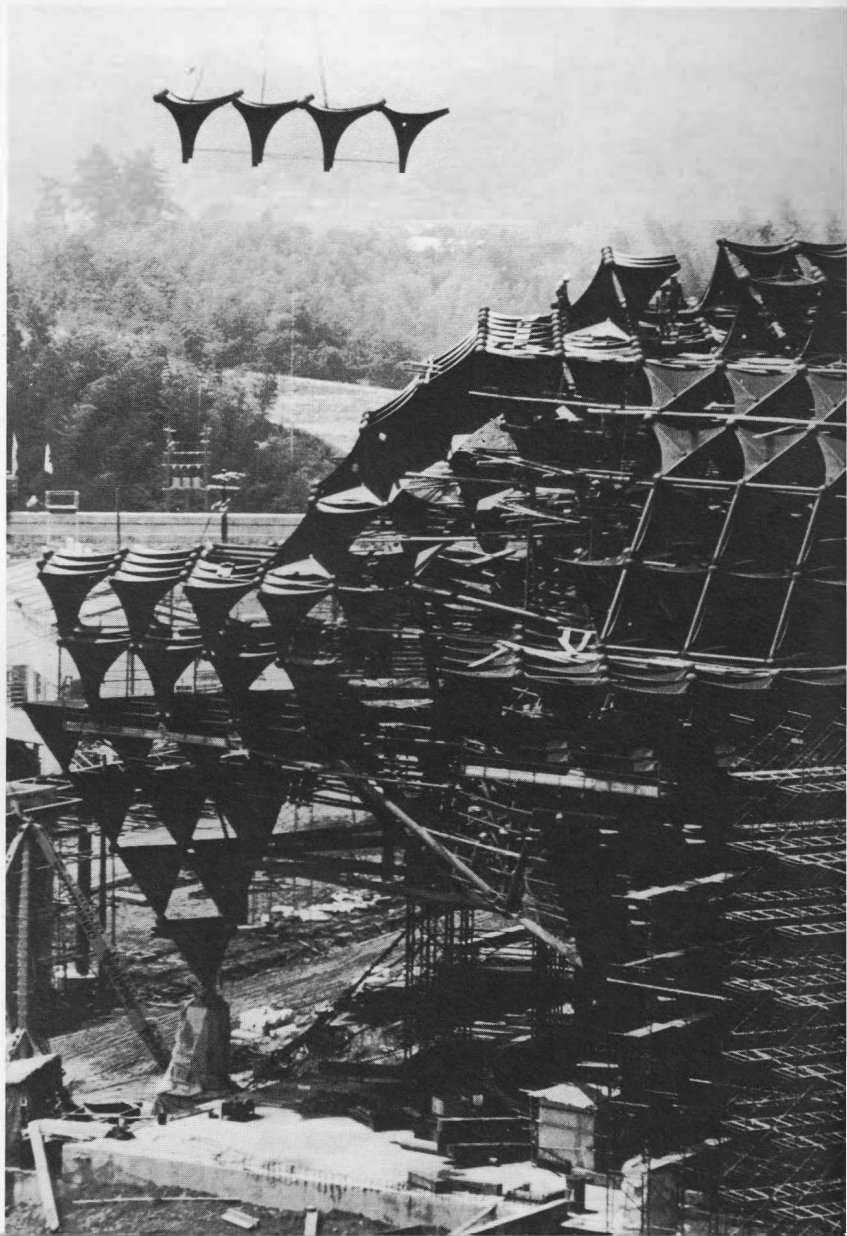
Section



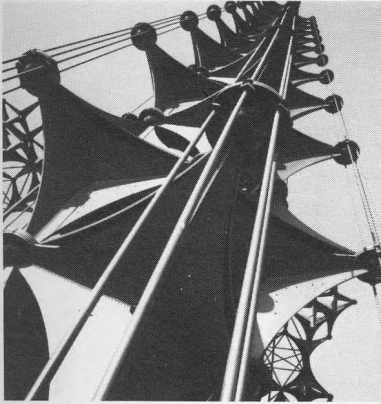
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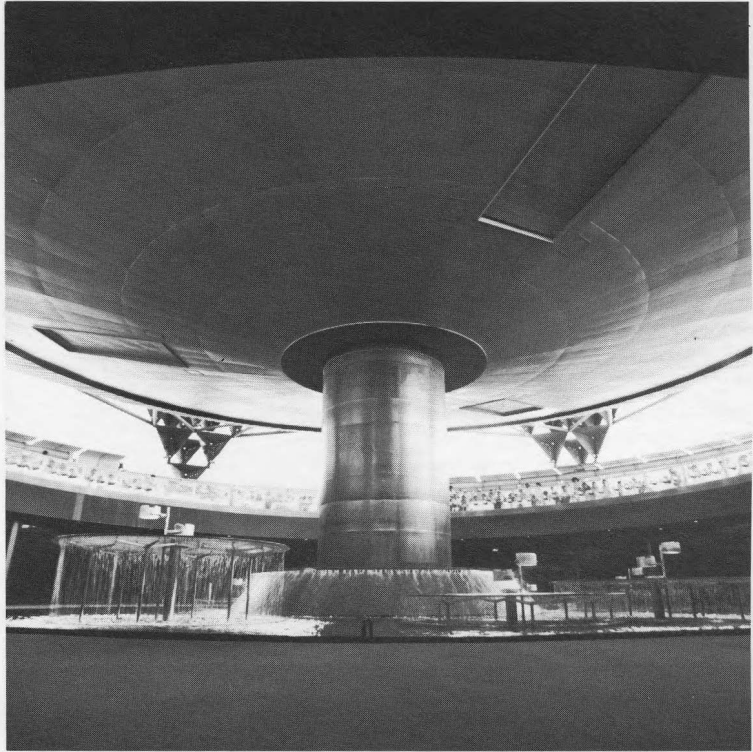
Model



Erection of the structure



Symbolic tower



Floor of theatre with 500 seats lifted by oil pressure



Interior of theatre

Big Box, 1974 (Big Box Seibu, 1974)

132 This building is a big box with multiple functions. The exterior looks like a black box with as little outward expression as possible. However, the front wall was carefully designed by the graphic designer Kohei Sugiura and other walls have capsules attached with stairways, toilets and piping exposed. The interior contains a railway terminal, shopping centre, restaurants, bowling alley, sauna, sports centre, a laser-type rifle range, a golf driving range and a music studio.

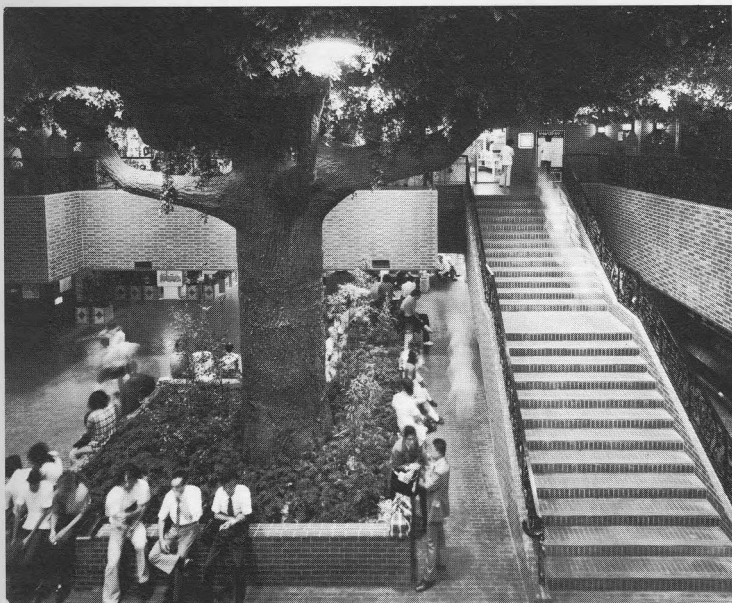
It uses a wall structure with no columns and post-tensioning beams so that the interior can be altered freely.



The image on the façade changes through a rotating mechanism

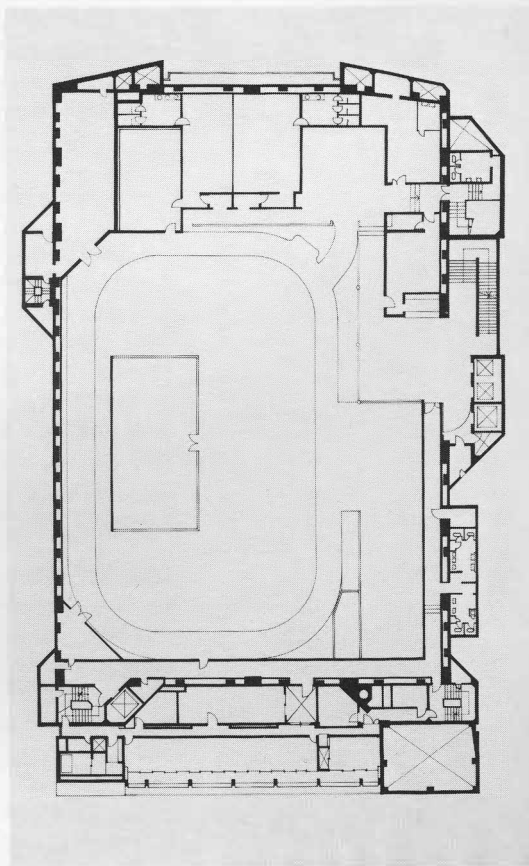
Side view showing capsules, piping and staircase





Interior showing a plastic tree

Audio-visual room



Plan

Chapter 3

Architecture of the Street

This article was first published in the Japanese architectural magazine Kenchiku Bunka in January 1963. It relates to my works concerned with the nature of the street, starting with the Nishijin Labour Centre. This paper was later developed into a comparative study of Japanese and European cities which was published by Kinokuniya Shoten in March 1965 as a book, Urban Design.

Traditionally there have never been plazas or squares in oriental cities. Their functions have been performed by streets.

As shown by the Vedic scriptures, four types of city design were conceived in ancient India. These were called Dandaka, Nandyavarta, Padmaka, and Swastika, all characterized by lattices of straight streets. The towns ranged in scale from 1200 by 1200 metres to 7500 by 7500 metres, with two thirds of the total space devoted to farming. Homestead units varied from 7.2 by 4.8 metres to 12 by 9.6 metres, with a courtyard providing shelter for livestock. The first step in town planning was to draw a line between two points (east-west) set by a sundial. A trunk road was built along the north-south line of this road and was called the Rajabata, or King's road. Crossing roads were named the Mahakara, boulevard. These two types of road formed the basic skeleton of the town.

These Indian town plans had no plazas or squares. Public buildings and temples were erected along the Rajabata and Mahakara, and a linden tree was planted at their intersection. The tree was believed to be a mother of the sun, the moon and the stars – a symbol of the mystical powers governing the universe. But it was not a nucleus for the citizens' daily activities. Social space was provided by the two roads, the Rajabata, which might be called the 'Sun road' since the sun shone on it throughout the day, and the Mahakara, a ready passage for wind and hence the 'Wind road'. I can imagine that the Sun road was a lively place, filled with people after the long rainy seasons, enjoying the good weather once again. On hot humid nights, many must have moved their beds on to the Wind road, watching the stars in the night sky before a breeze lulled them to sleep.

In addition to this domestic function, the Sun road and the Wind road were used for festive parades while religious processions were held on the Mangarabichi, Fortune road, on the periphery of the town. So, urban spaces for religious rites and for demonstrations of power existed and functioned on the same streets as those on which the lives of the people were lived.

This was generally true of Japanese cities also, which featured wooden houses offering easy access. The ancient capital of Kyoto, previously called Heian, had an elaborate latticed pattern of streets and avenues. But here, too, there was no plaza. The temples and public buildings were built along boulevards instead of being concentrated in the centre when they might enclose a public square or form the nucleus of the city



One possible reason why this arrangement was adopted was that it was convenient for festivals which in the East were mostly in the form of processions rather than mass assemblies in a plaza. These major streets in Kyoto, however, did not function as part of the community life of the ordinary people. They were intended for the nobles in horse-drawn carriages and for festive processions, making a showcase for the power of the rulers and also for the aristocrats. They were lined by houses of wealthy citizens, an arrangement designed to link the inhabitants to the city through rites and the display of power.

Minor roads, alleys, or passages, on the other hand, were an integral part of the populace's life style. Alleys which thread through typical town houses with narrow entrances, such as in the Nishijin weavers' district in Kyoto, are communal roads, in contrast to traffic roads. Major streets marked boundaries of different districts or communities, while minor roads wove through a small community. Houses lining a minor road formed a closely related neighbourhood. These minor roads are barely three metres wide. Façades with lattice windows made the houses more a part of the street than a shelter from it. On summer evenings these roads were crowded with people seeking relief from the heat. People chatted together over the lattice windows and the rooms facing the road occasionally doubled as shops. While major streets were places for formalities, festivals and demonstrations, minor roads were communal areas for the common people.

The same lack of squares or plazas applies to the castle towns that thrived in Japan from the Middle Ages to the Edo period (1603-1868). These towns evolved around a castle, which was the nucleus of the town and the residence of the local ruler, but the town's vitality came not from the castle but from a network of streets running through sections inhabited by commoners. From a distance the highway appeared to lead straight to the castle, the symbol of the town, but once inside the castle town it was a labyrinth. Temples were located along the highway outside the town, while craftsmen and merchants – such as carpenters, shoemakers, ironsmiths, tailors, and silver and silk dealers – were given quarters inside the town. The sections for blacksmiths and gunsmiths were situated down from the prevailing wind because they used fire in their work. Horse traders were required to live at the edge of the town by the highway. Stagecoach relay stations were assigned their quarters at the entrance to the town.

The main street was the scene of festive processions. Fairs were held along it to promote the development of the town. During the *Bon* season in summer, the time when the ancestral spirits are believed to return to their earthly homes, large crowds turned out on the temple-lined streets.

As evidenced by the use of the word *tsuji* ('streetcorner' or, broadly, 'street') in such combinations as '*tsuji giri*' ('armed street robbery'), '*tsuji seppo*' ('street preaching'), '*tsuji fuda*' ('street bulletin board'), and '*tsuji uranai*' ('street fortune-telling'), streets in Japanese towns served not only as a road for traffic but also as space for communal life.

The approach to the Kōpira Shrine in Shikoku offers a typical example of such dual functions. It goes through a town with souvenir stores usually crowded with visiting worshippers and is lined with rows of stone lanterns, pine trees, and stone walls. At places the approach road is not merely a traffic road but is a complex where nature, architecture and road all meet. Some sections are paved with cobblestones, and there are long, steep flights of stone steps. All are blended to make the street lively and enjoyable.

(1) A traditional street festival

The street has been put to particular religious use in the approach to the Grand Shrines of Ise, dedicated to Amaterasu Ōmikami (the Sun goddess), the highest deity of Shinto. These shrines are the best of the nation's architectural tradition. Sacred trees and sacred rocks are placed at key points along the winding path which from time to time crosses bridges and follows streams. As a result, even the sounds heard while walking along the approach produce in the worshipper a growing emotional awareness of serenity, and also serve as a psychological preparation before praying at the shrines – an impression apparently intended by the original builders. The arrangement means that the effective or inspirational confines of the shrines extend all the way to the Isuzu river, the starting point of the approach.

Were there streets which fulfilled dual functions in the West? The ancient Greek *polis* of Miletus was shaped by latticed streets but differed in two fundamental ways from oriental cities. One is the manner in which the public buildings were laid out. Oriental towns had temples and public buildings along streets, which enabled the roads to function as public spaces and link individual private houses to the community, while the Greek *polis* had a central, gravitational public area called the *agora*.

The *agora* was a place for fairs and political meetings, and fortune-tellers and prostitutes solicited customers there. There also must have been robbers lurking in the shadows at night. The latticed streets were connected to the plaza by colonnades. The *agora*, therefore, was the vehicle which related the lives of individual inhabitants to the city and infused a community consciousness.

The other difference concerns the relationship between houses and the road outside. Miletus housing consisted mainly of villas. Rooms opened onto a courtyard which played a central role in family life and was used for socializing with neighbours. Thick walls separated the house from the road, with only a few small windows. This structure was rigidly closed to the outside, unlike Japanese houses which consist mainly of post and beam structures which open to the street. A ditch, one to two metres wide, made of stone and running behind the houses, was presumably filled with refuse and rainwater on rainy days.

The fragmentation of spaces according to function was already evident in Miletus: rooms for private space, a court communal area for the family and neighbours, a road with a drainage system, roads for traffic, plazas in the centre of the *polis*. These spaces have functional order. The separation between architecture and roads had already begun during the Greek period.

Plazas and squares in feudal cities during the Middle Ages took on a stronger character as the place for the exhibition of power and religious rites. Street patterns become more centripetal, culminating in a radial arrangement under which all roads converged on the ruler's plaza.

The emergence of citizens' plazas and squares in the West had to wait until merchants gained significant social importance and town dwellers enjoyed major general improvements in their living standards. Countless neighbourhood plazas and squares were created then, while the monumental central square was retained intact. This organization was an attempt to relate the lives of individuals to the city as much as possible, but nothing near the Orient's communal and more flexible street pattern developed in the West. This difference is largely attributable to the different ways of thinking in the East and West.

Whether or not a city is to rely on a plaza or on streets for social functions depends upon whether a dualistic or non-dualistic view is taken of buildings and the city. Christianity is an integral part of European civilization, and in fact, European civilization is tantamount to Christian civilization. Christianity has developed into a dualistic way of looking at life, with its conflicting concepts of God and the Devil, with spiritual life of Heaven and the materialistic world, and the Creator and the created.

Dualism is embedded deep in Western thought, but is not solely attributable to Christianity. Dualistic theories that the universe was fundamentally constructed of mind and matter were enunciated as early as the time of ancient Greece. Descartes later established a dualistic mind-matter philosophy, in which mind and matter were defined as finite beings dependent on God. Kant, who distinguished phenomena from matter and freedom from necessity, was a typical dualist. The rationalist tradition produced the philosophical basis for the industrialization and modernization of society. As rationalism has its roots in dualism, dualism has become the predominant mode of thinking in the world today.

Virtually all concepts and expressions come in pairs, such as mind and body, arts and science, man and machine, intuition and reason. Man has untiringly pursued such contrasting religions separately only to find with horror that there is a deep gulf between them. The great modern civilization, the brainchild of European rationalism, is in large part the outcome of the recognition of the gulf and the efforts to bridge it at all costs.

The advances of modern design are also rooted in dualism. They are marked by such contrasting concepts as beauty versus utility, shape versus function, buildings versus the city, human scale and superhuman scale. It seems to me that the architectural arguments that have been made so far can be likened to the movements of a pendulum swinging between two extremes. The American architect Louis Sullivan, often referred to as the first man to advocate functionalism, said that shape follows function. This kind of thinking dominates modern design, although specific pronouncements vary from a moderate 'what has been pursued for function ought to have due beauty' to a radical 'only functional objects have beauty'.

To the dualist who considers that humanity, sensibility and beauty constitute the opposite of function, functionalism would seem to be a concession and a defeat of humanity. Hence the assertion that 'only beautiful things are functional'. But polemics like this cannot form a philosophy of creation because the differences are only a matter of degree as to which of two poles the creator should give greater consideration to.

A dualistic approach to the solution of problems invariably employs the concept of harmony. For example, the dualist conceives of human scale and super-human scale in urban spaces and regards them as mutually conflicting. In order to close the gap between them he develops various hierarchies of scale bringing human scale and super-human scale gradually closer to each other. If the incompatibility is fundamental, a gap to be bridged will remain no matter how many hierarchies are established. Conversely, if harmony is attained between the two extremes, it means that they never were fundamentally at variance with each other to begin with. When used in creation, dualism is bound to produce compromise or evasion if pursued to its extreme.

What is needed now is to move from dualism to pluralism and then to coexistence without the need for compromise.

A city is the sum of a countless variety of spaces. In terms of size it ranges from human scale such as houses to super-human sizes like trunk roads, bridges, skyscrapers and parking lots. Speeds vary from the sitting or standing and walking pace to those of automobiles and trains. In terms of functions, the city extends from human spaces such as houses and amusement areas to mechanical spaces such as urban facilities like water and sewage systems and subways. As regards durability, the city operates on home appliances, piping and the like that last about five years and civil engineering works that stand use for scores of years. Is an orderly and successive arrangement of these spaces a desirable state of affairs?

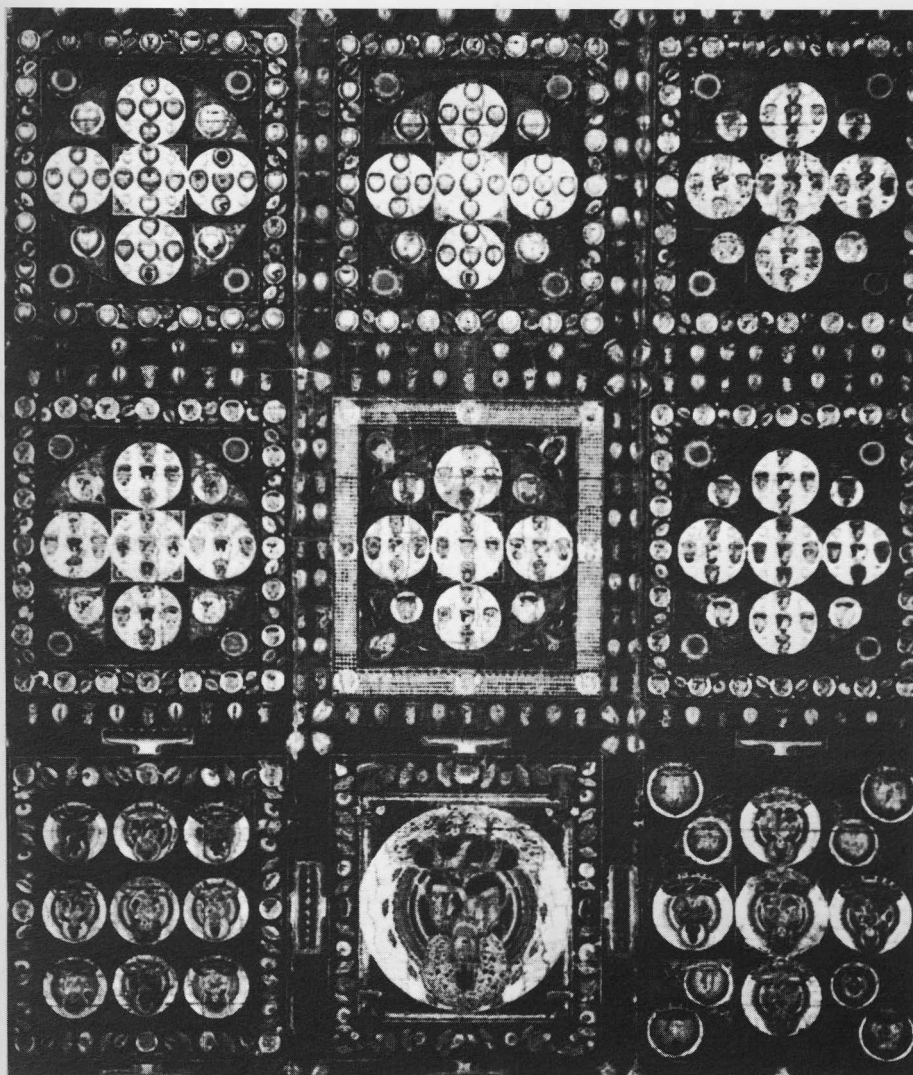
Man desires the surprise of interrupted spaces and wants change and rhythm in successive spaces. Surprises of this kind are experienced, for example, when a road with a blocked view ahead suddenly straightens and the blue of the distant sea comes into sight, or when a sloping road dips without warning and you find yourself looking down at a sprawling town. To this same category belong the sense of freedom a car driver feels on moving from a congested street onto an expressway and a strange feeling of accomplishment associated with the long stretch of an elevated highway built over crowded rooftops.

The dramatic excitement all comes from interrupted spaces. It is the same with drama, music and literature. A story is interesting when an apparently placid situation, dotted with innocent hints of uneasiness, is abruptly broken by an unexpected development which triggers a series of dramatic events leading to a *dénouement*. In this case, disconnected spaces conflict with each other but coexist nevertheless.

Are oriental cities characterized by coexistent spaces? As pointed out earlier, they have no plazas, but this is offset by the fact that buildings have spaces open to the street, and the street plays the dual function of traffic facility and living area. In other words, buildings and the city are fused to each other from conception. In contrast, the buildings of European cities are closed to the road, partly because they are made of stone, and since ancient times spaces for living and traffic have been separated. As a result, plazas or squares of various sizes became necessary to link buildings to the city.

Coexistence in architecture does not mean the resolution of conflicts; it means the development of a *third* space which enables conflicts to exist side by side in harmony while remaining at variance. It is easy to find doctrines of coexistence in oriental philosophies. The absolute monism of the Vedanta school of Hinduism merges all opposing ideas in the concept of ego, the fundamental element of individual existence. Nagarjuna, founder of the Madhyamika school of Mahayana Buddhism, said, 'We are not nihilists. By rejecting both the theory that nothing exists and the theory that there is being, we illumine the road to the castle of Nirvana (we attain Buddhahood).' Buddhism's notion of the Void offers a *third* state apart from a dualistic belief in opposing existence and non-existence. Buddhist beliefs resemble the mystic views of the universe held by Chinese philosophers Lao Tzu and Chuang Tzu. The theory of *yin* and *yang*, the dominant philosophy in the ancient Orient, is actually three-phased, with man introduced between the heaven (positive) and the earth (negative) as an agent of coexistence. The living person is a *third* element enabling contending elements to coexist with each other.

In a world of dualistic distinctions, such as existence versus non-



(2) *Kongodai*, a Japanese Buddhist mandala

existence, positive versus negative, and mind versus body, man is torn between opposing ideas. He is denied knowledge of the wholeness of himself as man.

Tantric Buddhism that found its way from India to Tibet holds that, in addition to the three bodies of the Buddha which are abstractly conceived of in Mahayana Buddhism, there is another body, the Body of Great Pleasure. It aims at an ideal state of indulgence or absorption in which all desires are satisfied, and preaches that attaining the state of the Void, the goal of Buddhism, is the same as complete indulgence of the senses. There are four stages of development for the devotee in Esoteric Buddhism – action, application, perfection, and supreme perfection. In the Tantric teachings, training for Great Pleasure takes place in the last of these. Value is placed on sexual indulgence at this level with beautiful girls of the Chandala class, whose function is likened to that of mandalas. My interest here is not in the

training itself but in the fact that a third and lively factor – human desire – is introduced between the abstract concepts of existence and non-existence, because it suggests something to me: are urban spaces like mandalas?¹

The concept of *kū* (*śūnyatā*) is used in a variety of senses in Buddhism, but what it means fundamentally is the emptiness of man and the emptiness of law. The former means making the self void, the latter denies that forces at work behind all phenomena in the universe ever change and holds that everything exists and occurs according to universal causality. It is said that Hinayana ('Little Vehicle') Buddhism teaches the emptiness of man and Mahayana Buddhism teaches both the emptiness of man and the emptiness of law.

Seeing the Buddhist *kū* not as a state of dead emptiness but as a world of substance, an entity of human desires, the concept is far-reaching, because it means that all spaces are full of such desires and substance. *Kū* is a world which everything comes from and goes to according to Rinne (*saṃsāra*), the law of causality, and as such is a model of what I am trying to create in my metabolic urban spaces.

Dualism was also denied in Zen philosophy in both China and Japan. The following episode involving Kamarashira, an Indian scholar of Buddhism, and the Chinese Zen priest Ta Cheng illustrates the way Zen conceives of life. When Kamarashira arrived in China from India, Ta Cheng went to a river bank to greet him. Exchanging subtle probing words, the two great men attempted to assess the extent of each other's intellect. Kamarashira walked around Ta Cheng three times, with his body bent. This meant that he was asking the Chinese priest what he thought was the cause of the transmigration of the soul through the Buddhist three-fold worlds. Ta Cheng responded by taking off his coat suddenly and hitting the ground with it twice. The gesture signified that the cause of transmigration lay in the false conception that the subject and the object are separate entities at variance with each other.

The problems confronting modern architecture are those of European rationalism. Is it too much to say that the manner in which urban spaces function in oriental cities, namely a Buddhist way, offers the only way to overcome the problem?

¹ Mandala: an image which encompasses all cosmic principles. Originally, in India this was the stand on which images of the Buddha were placed for worship. In a strict sense, in esoteric Buddhism, it is a Buddhist picture depicting all Buddhas and Bodhisattvas.

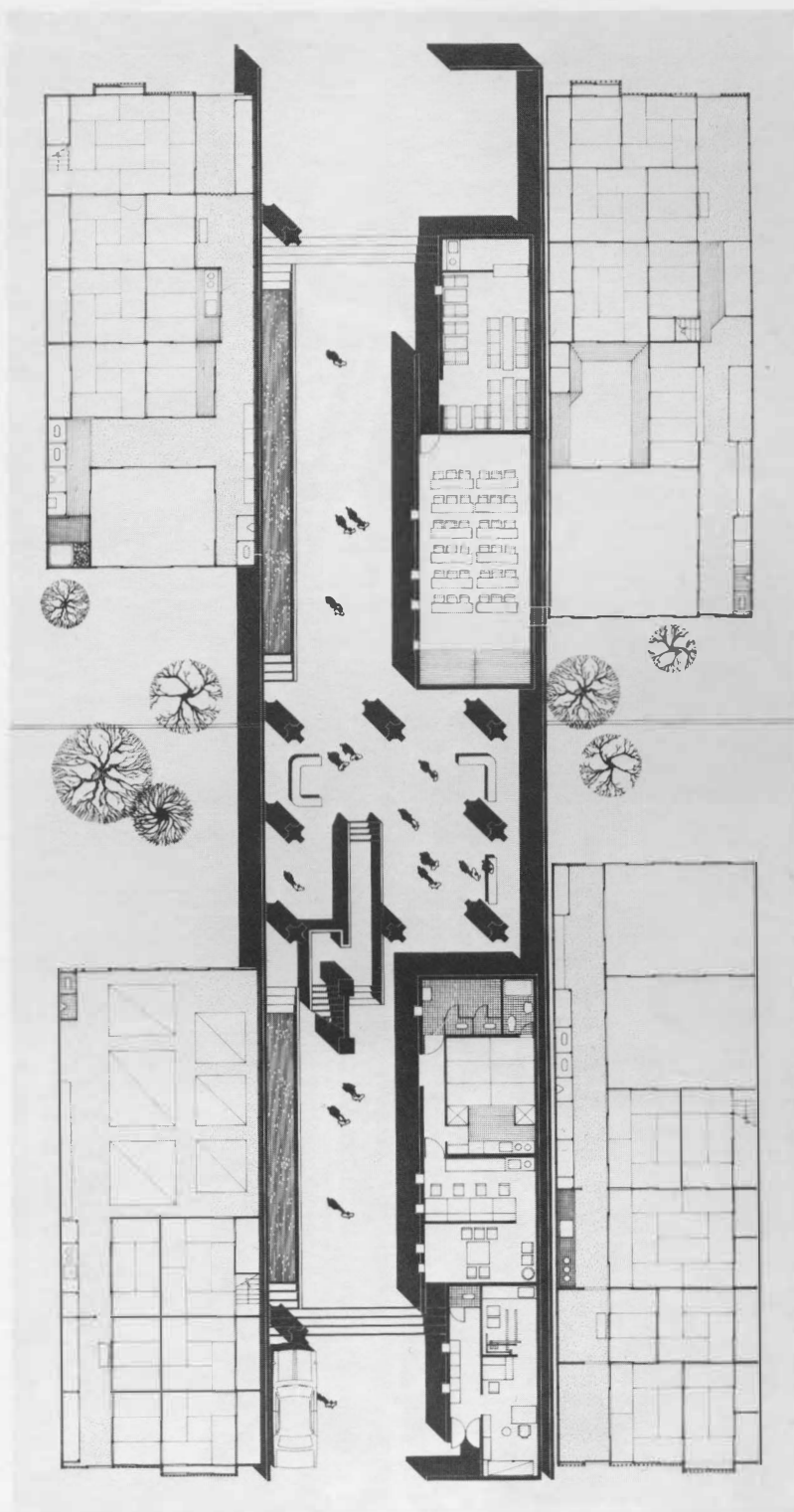
Nishijin Labour Centre, 1962

The Nishijin area in Japan's ancient capital, Kyoto, houses many craftsmen and cottage industries, particularly weavers of Nishijin silk. The area preserves the traditional street and road pattern of old Kyoto. This centre was constructed mainly by the Religious Faculty of Doshisha University as a welfare facility for the workers living in the area. The plan used the principles of architecture of the street, with a passageway the length of two tradesmen's houses.

Since a street which has normally been used as an extension of living and private or personal space is now accessible to automobiles, the character of Kyoto, which has no squares and parks like those of Western European cities, is threatened. This project was designed to harmonize with the regularity of Kyoto, rather than to provide new pedestrian streets.

This approach is analogous to traditional Chinese medical treatment such as massage and acupuncture, viewed in contrast to Western surgery.

This was my first project using architecture of the street.

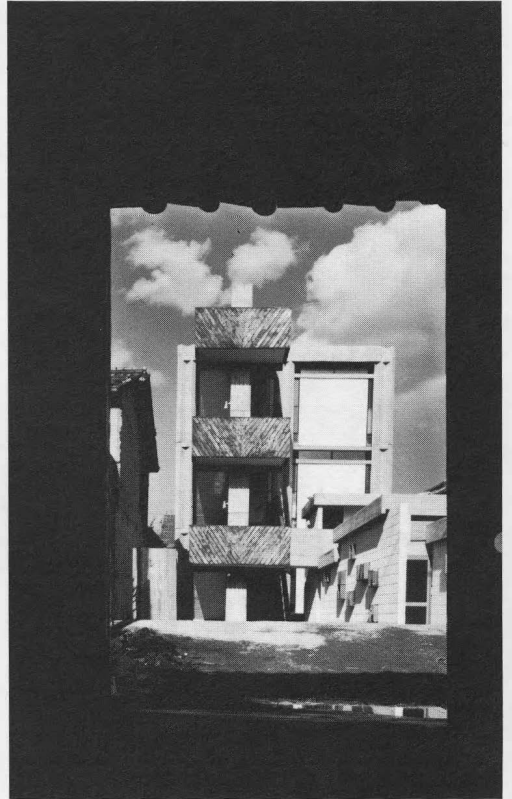


Plan



Open staircase

Front view from existing town house

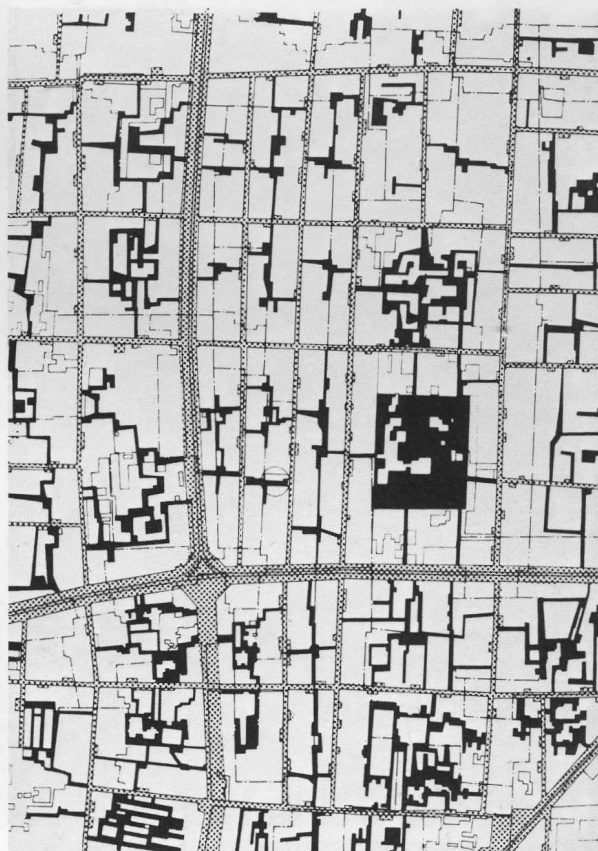


Interior



Isometric drawing

Redevelopment project for the Nishijin district of Kyoto. The existing structure is disturbed as little as possible in furthering the pedestrian network



Central Lodge in the National Children's Land, 1965

146 The lodge is near a camp site for children. The lower level has a meeting hall and dining room and the upper level contains sleeping accommodation.

Each of the levels has its own form and there is a space between them. The landscape is visible through the space between the levels and people can walk through on a walkway on the roof. In the centre of the lower level there is a crevice in the form of a pathway which people can pass through. This area contains street lights and drinking fountains made of granite.

The 'in-between' space which is both outside and inside is a form of architecture of the street.

Light, shadow and ambivalence are the major components.

The gently sloping site for the Children's Land Camp site spreads out on the shores of an artificial lake in Kohoku Ward, Yokohama. This lodge building nestles among a fine range of trees on some flat land above the water's edge. (The remains of an old arsenal are under the hill.)

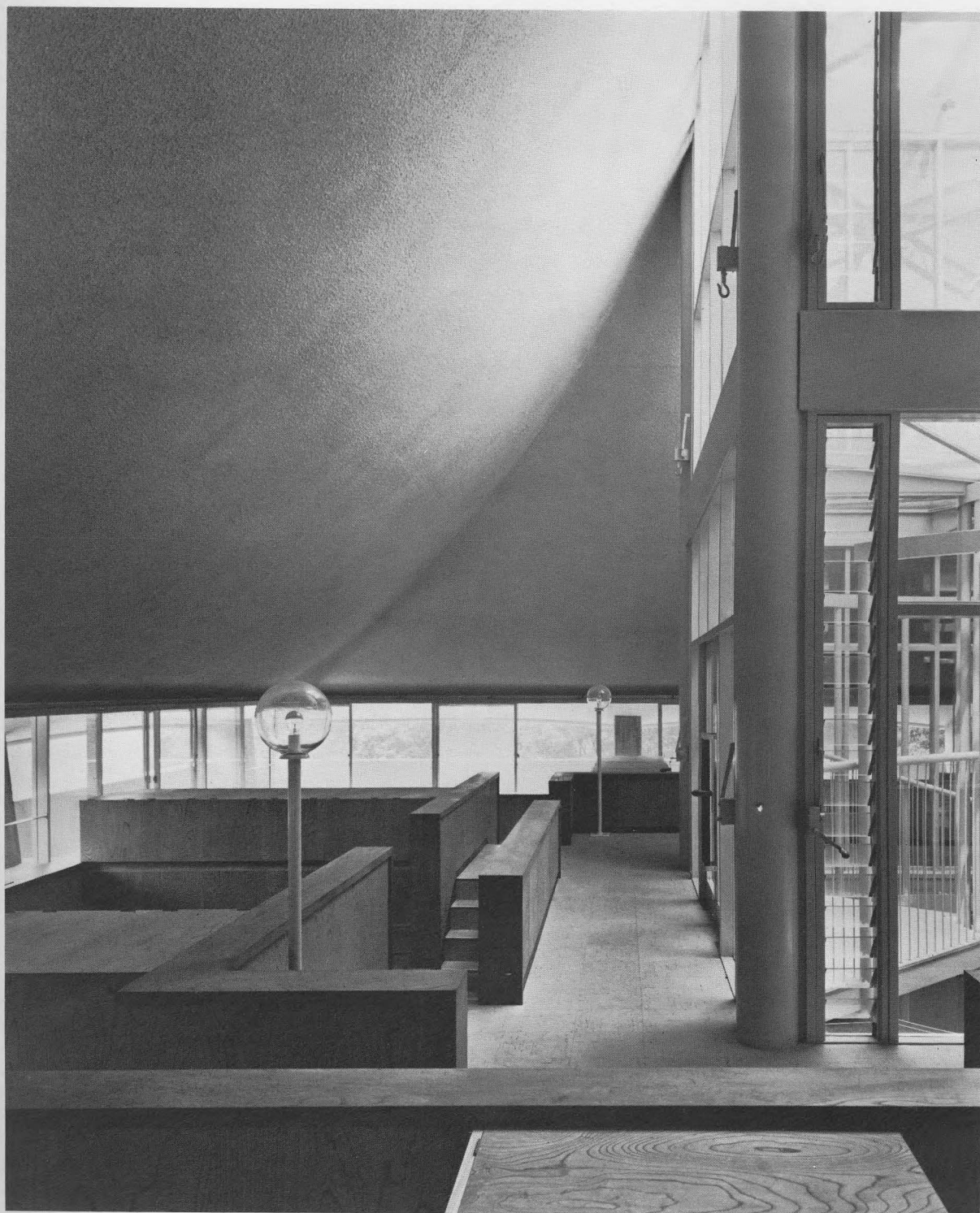
The building serves the double purpose of a training hall for the camp leaders and a dining hall, meeting room, bath and toilet facility for the children's use. There are also sleeping quarters for children too small to sleep in tents.

In keeping with the plan to let the children manage the camp themselves as much as possible, the lodge building has a great deal of what we might call abstract space. For instance, both the dining hall and the meeting hall are spaces free enough to permit a variety of uses beyond their basic functions. The abstract spaces with which the designers aimed at spatial freedom are not so much the result of creating unlimited spaces as they are of the application of a symbolic architecturalization of certain functional elements. The dining hall table and the tiered meeting hall seats are cases in point.

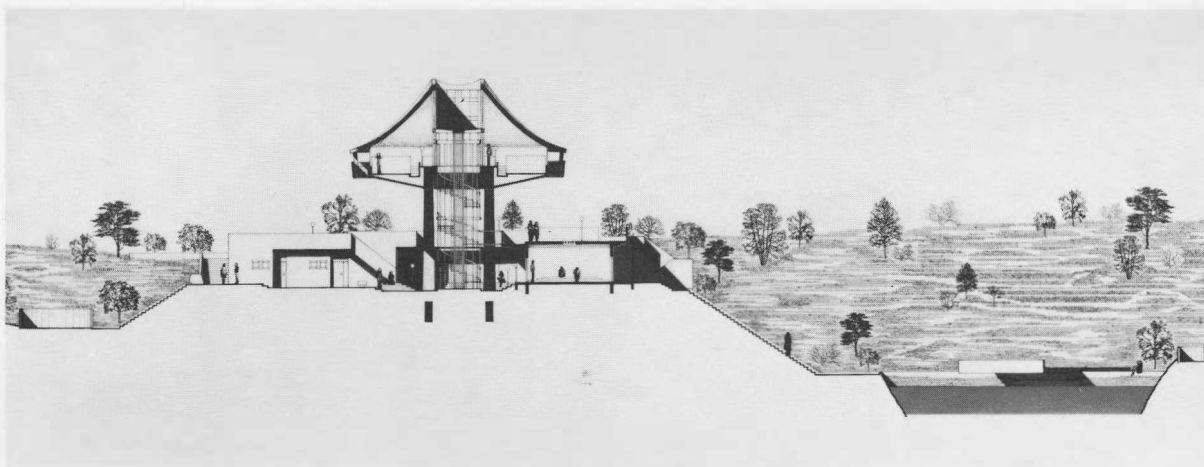
The designer believes that perhaps this building will come as a surprise to children accustomed to



External view



Dormitory



the usual cajolery from adults who fall over backwards to create buildings on children's measurements, childlike buildings that children can easily understand, and toys that offer the child no resistance whatsoever. Disneyland, for instance, is the essence of this give-the-children-whatever-they-want-as-long-as-it-keeps-them-happy attitude.

Of course the truth is that the children have their own dreams, and as they form groups of friends and acquaintances they will grow and develop best through coming into frequent contact with things that are not of the conventional 'child's world'

(*Japan Architect*, February 1965)

Section



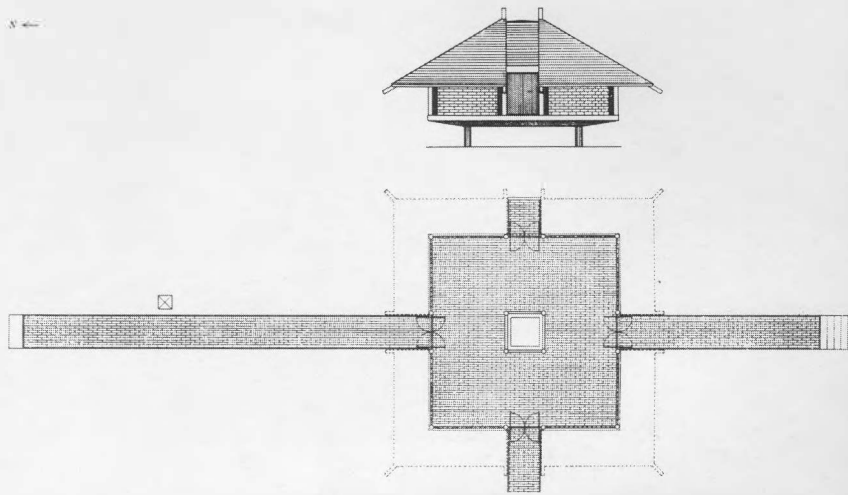
Street penetrating into the architecture

Hans Christian Andersen Memorial Museum, 1965

The volume of the building is divided and light enters through the gaps. These form streets passing through space. The roof serves as a shelter for exhibits. This type of architecture is designed for free access.

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Plan and elevation

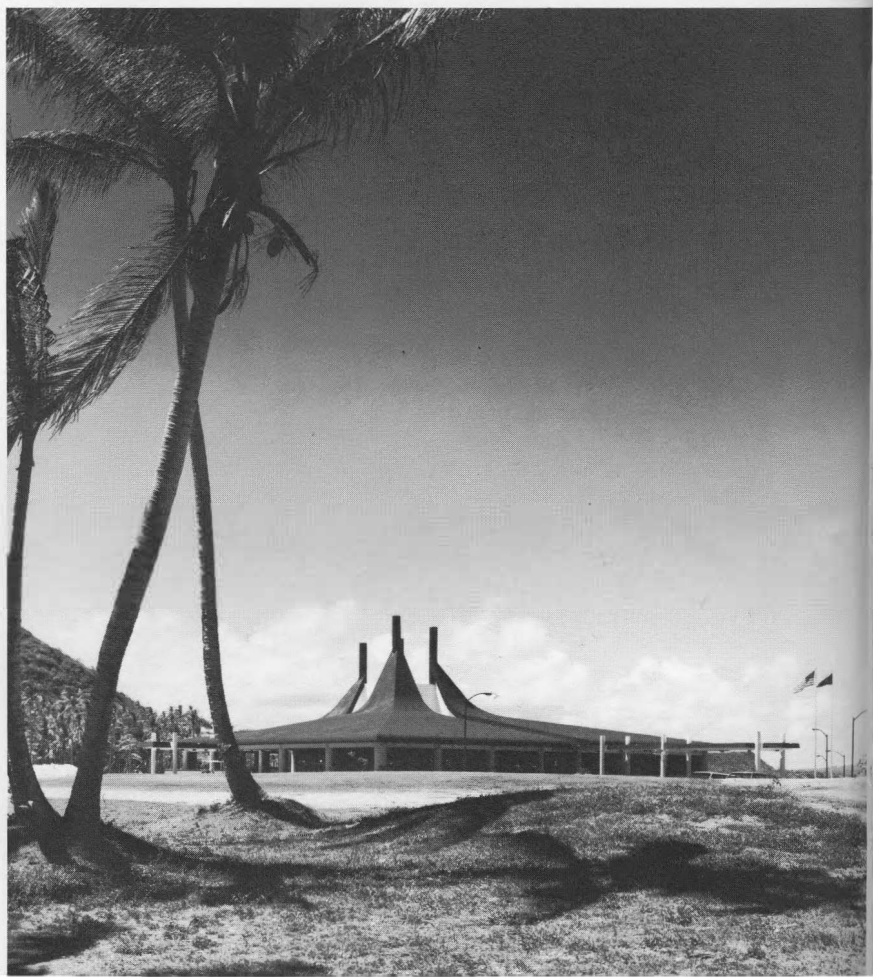


Interior





Side view

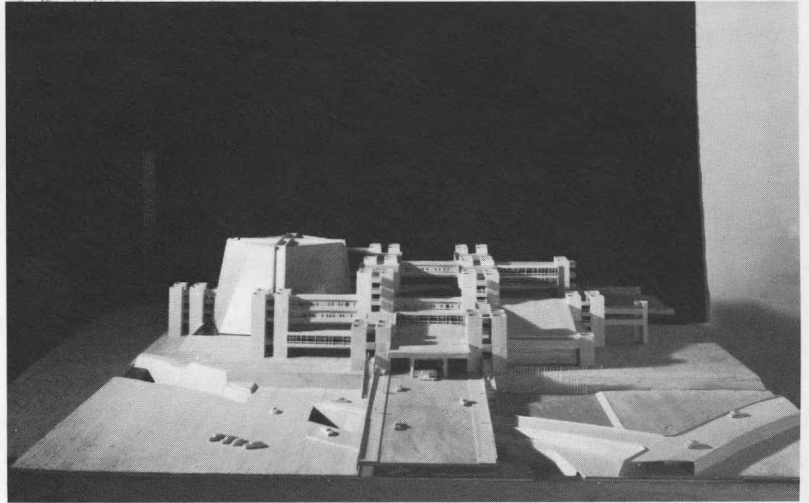


Club House in Guam island, USA 1973. The same system is adapted to this project for a golf club house

Kyoto International Conference Hall, 1963

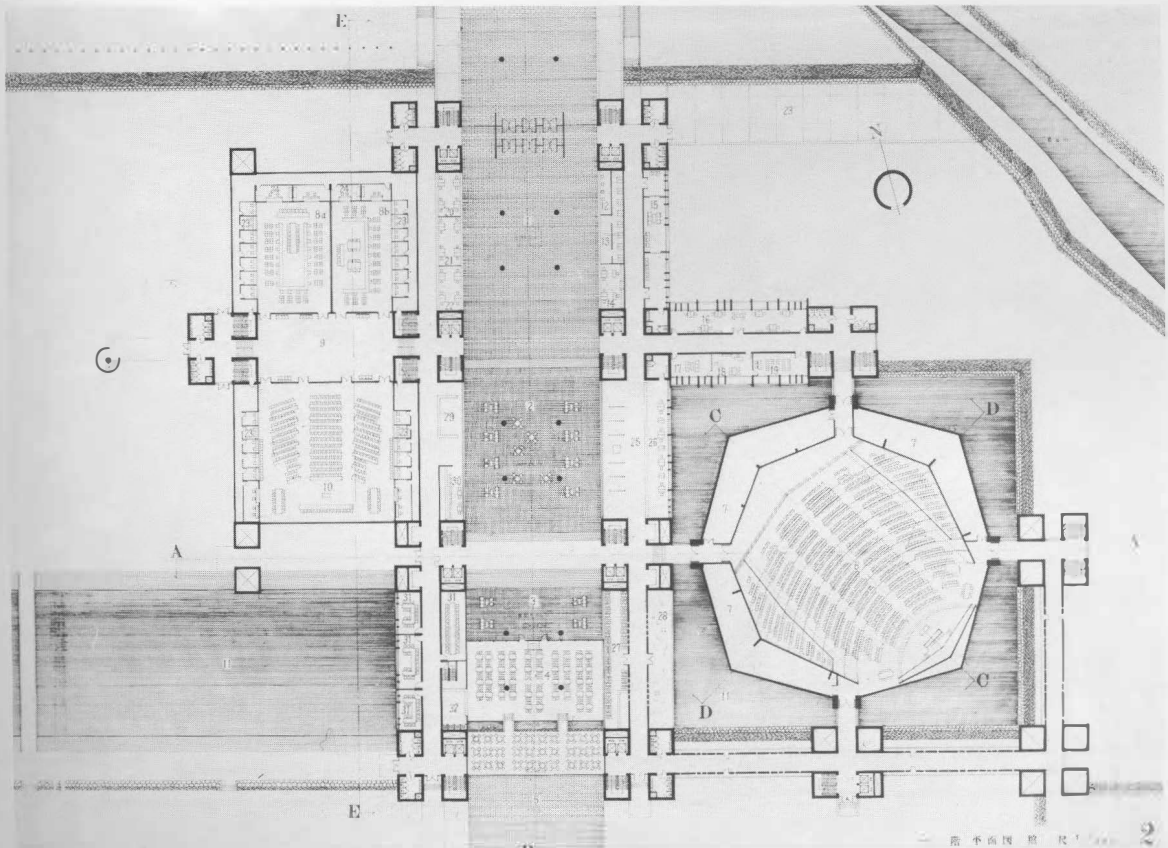
Street spaces are built on three-dimensional grids, formed by perpendicular shafts and passageway beams, embodying the growth principle. The three-dimensional grids create 'rooms', which include conference halls, meeting rooms and lobbies, around the street spaces.

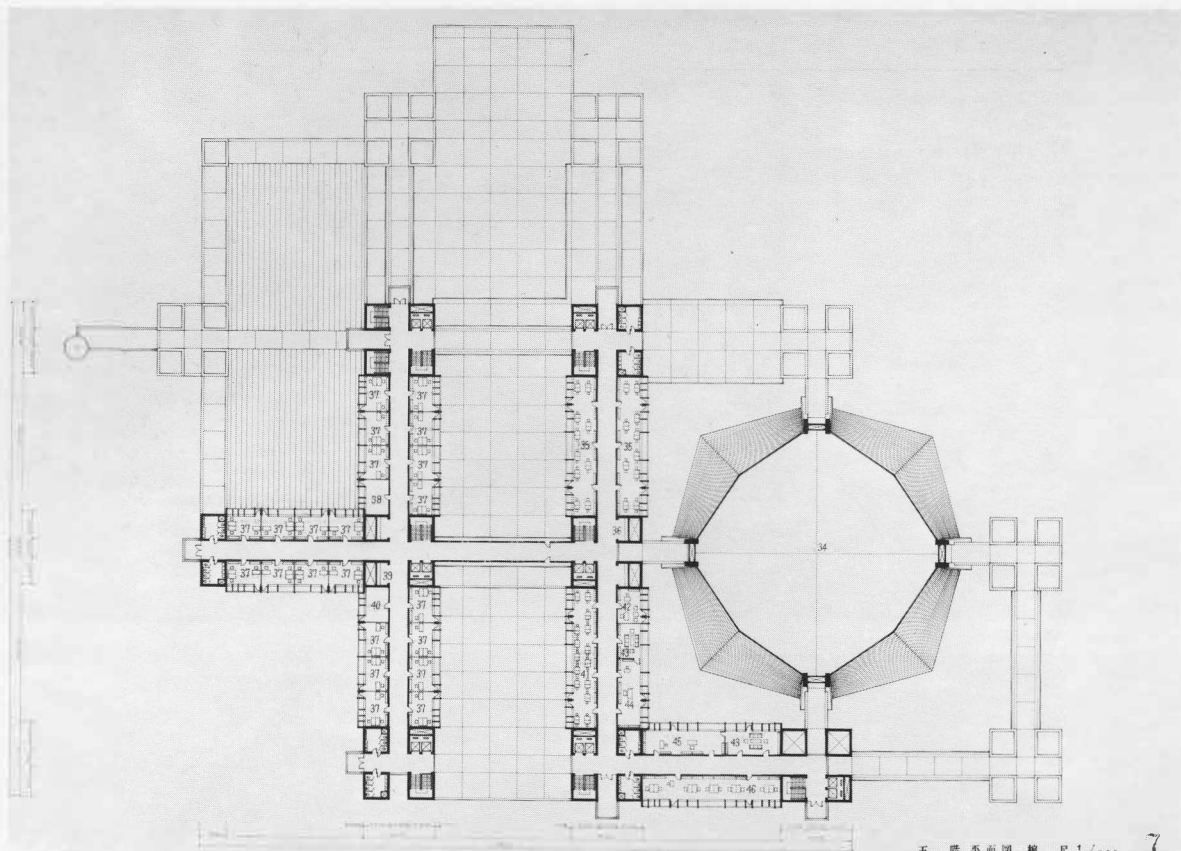
(The plan represents the expansion of the two-dimensional grid of the Agricultural City of 1960 to three dimensions.)



Model

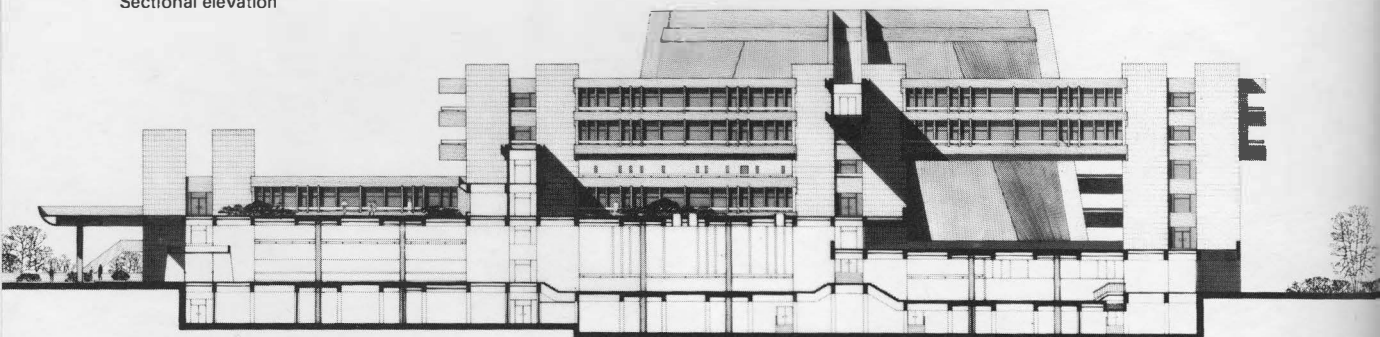
Plan of the ground level





Plan of the top floor

Sectional elevation



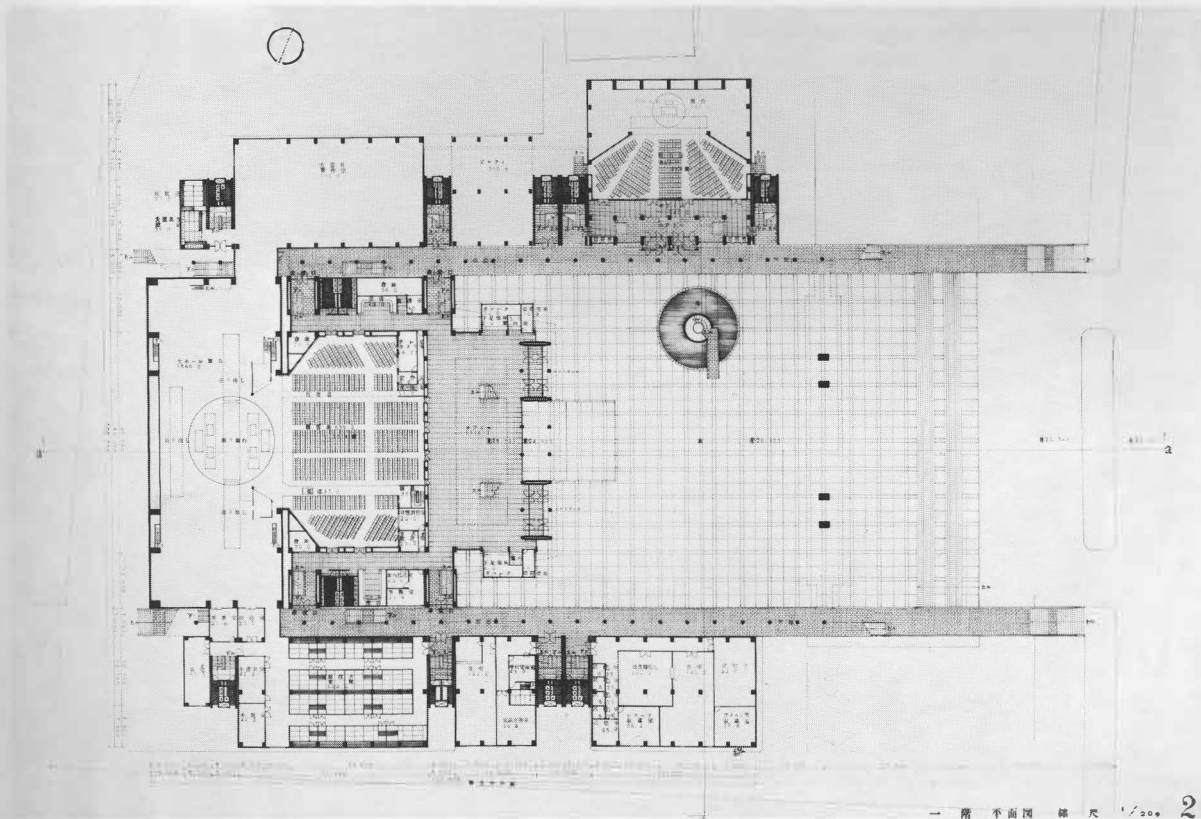
National Theatre, 1963

This building was the prototype of the corridor system (*kairo*) used for the TANU Headquarters Building in Tanzania in 1971. The main theatre is in the centre with the accessory facilities arranged around a corridor which surrounds it.



Aerial view of model

Plan of the ground level



The TANU Headquarters Building, Tanzania, 1972

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The building uses a *kairo* (corridor) system to combine various functions such as the party headquarters, national assembly and cultural centre. The corridors protect people from the exacting African climate.

The corridors provide organic connections between the exterior and interior and at the same time serve to cut the space into sections. The corridors also are architecture of the street which provide a space for people to mix.

(This design won first prize in an international competition. The capital of Tanzania is to be moved from Dar Es Salaam to Dodoma and, although originally designed for Dar Es Salaam, it is in the new capital that construction of this project will shortly begin.)

Concept

The building in its simple form consists of:

- an urban corridor which is elevated to create shade and allow the breeze to penetrate the building, and which encloses the three functions of the building to unify architecturally what is unified in fact,

- an enclosed plaza in which the people may assemble and which relates visually to Mnazi Mmoja and Independence Monument,
- an urban roof shade,
- an urban hall which allows interface between Parliament, Party and People.

All the elements are combined into a unified form as a landmark for Dar Es Salaam, a symbol for Tanzania.

Building Phases

The building has been planned so that the construction of the complex may be completed in two phases without affecting in any way the functioning of the building (TANU and Parliament in phase One; the Cultural Centre in phase Two), though the designers believe that the total concept of urban corridor and enclosed plaza will only be realized on completion of the entire building.

Future Extension

TANU office space may be extended by 25 per cent within the existing structure of the urban roof.

Natural Ventilation and Air-Conditioning

All places of assembly and senior officials' rooms will be air-conditioned. Package air conditioning systems located in the central plant room beneath the urban hall serve the house, conference and committee rooms in Parliament and TANU. The condensers are housed in the equipment beam at the apex of the urban roof. Vertical pipe shafts carrying water and air connect these two service areas. The cultural centre will be air-conditioned on a separate system.

All offices and spaces without air-conditioning have been designed to take advantage of the prevailing wind as natural ventilation, those facing east receive it through roof monitors and the remainder in the Urban Roof facing north-south receive it by deflection from the ventilation slots (3 m wide) which separate the office units.

In order to allow the breeze to penetrate the building the urban corridor has been elevated and the urban hall created to trap the wind and provide natural ventilation to the TANU offices.

Protection against the Sun

All spaces are protected from direct sunlight by the communicating ring beam which is used here as *brise-soleil*.

The urban roof gives shade in the enclosed plaza, the urban hall and the foyer of the house.

Construction

The main structural elements of the urban roof and urban corridor will be of reinforced concrete cast on site and in place, though some of the secondary structural elements of the floor and roof may be precast on site.

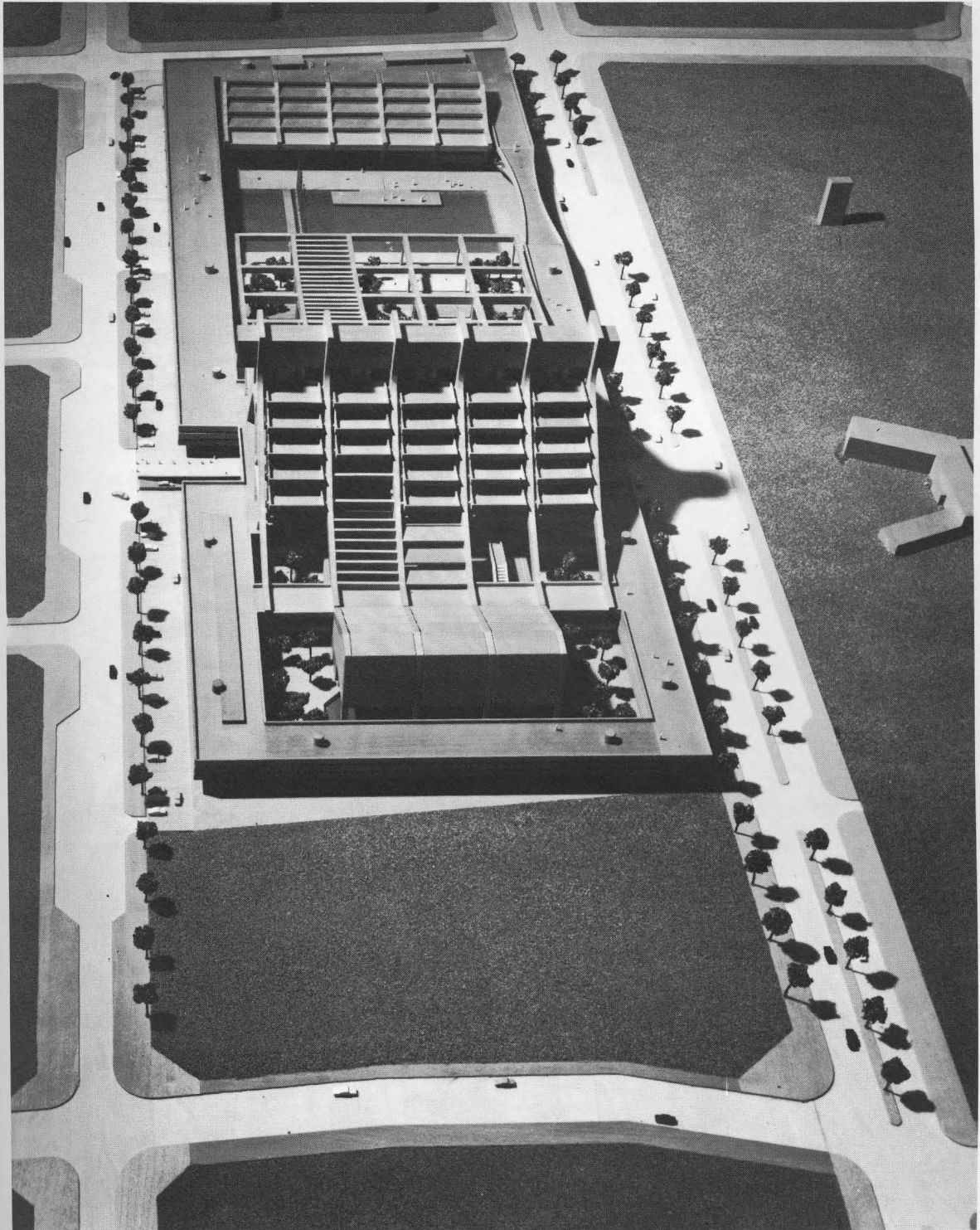
Neither pre-stressed nor post-tensioned concrete will be needed for the construction.

Further offices can be built in the future without disturbing those already in existence.

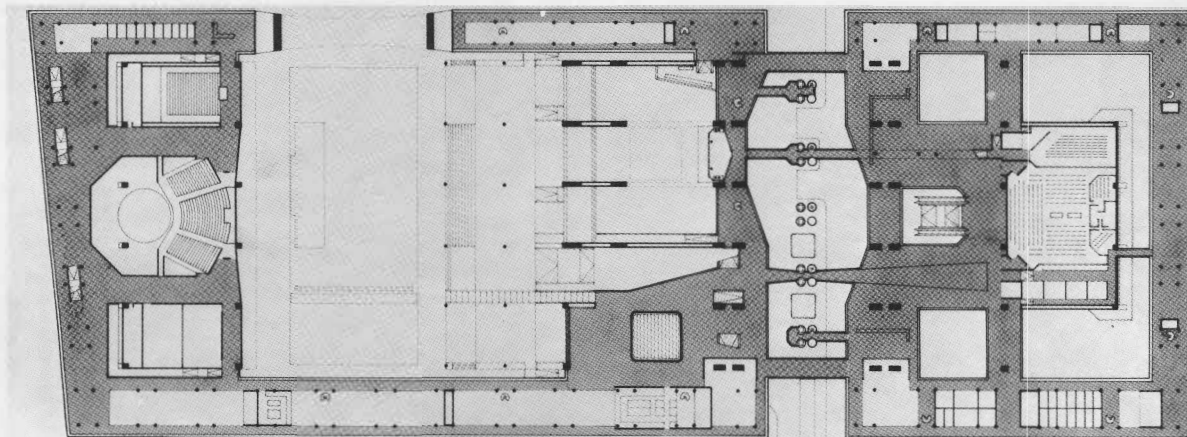
Relationship to surroundings

The building's relationship to Lumumba Street and Mnazi Mmoja was considered to be of paramount importance. The long, low profile of the urban corridor will give a new urban scale to Lumumba Street, consistent with its development as Dar Es Salaam's major thoroughfare. Mnazi Mmoja and the Independence Monument will assume a new significance when seen as part of a continuous space from within the enclosed plaza.

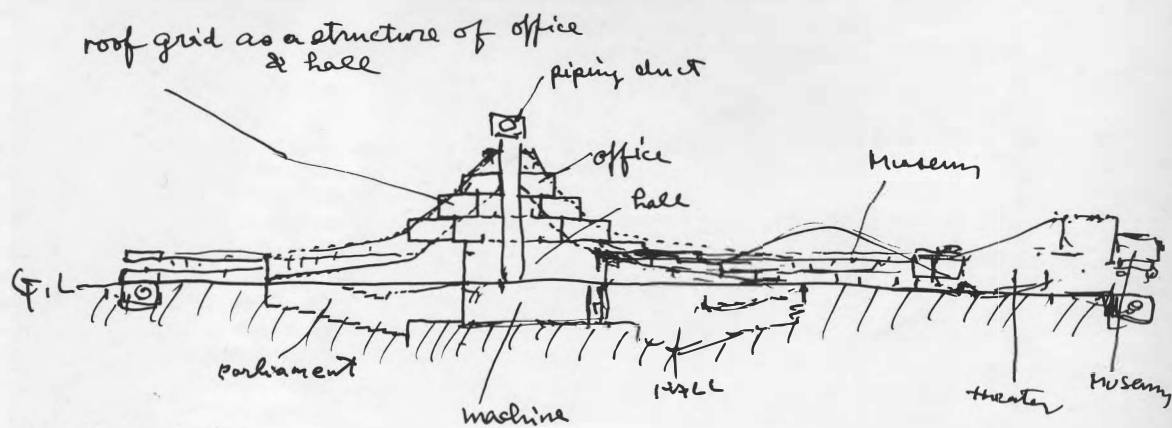
(Report for competition)



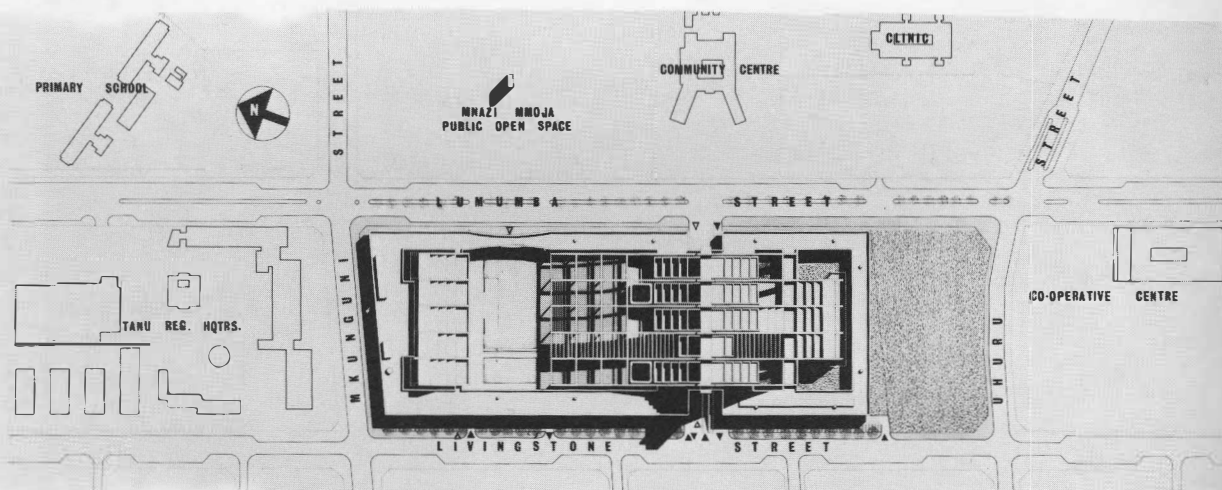
Aerial view of model



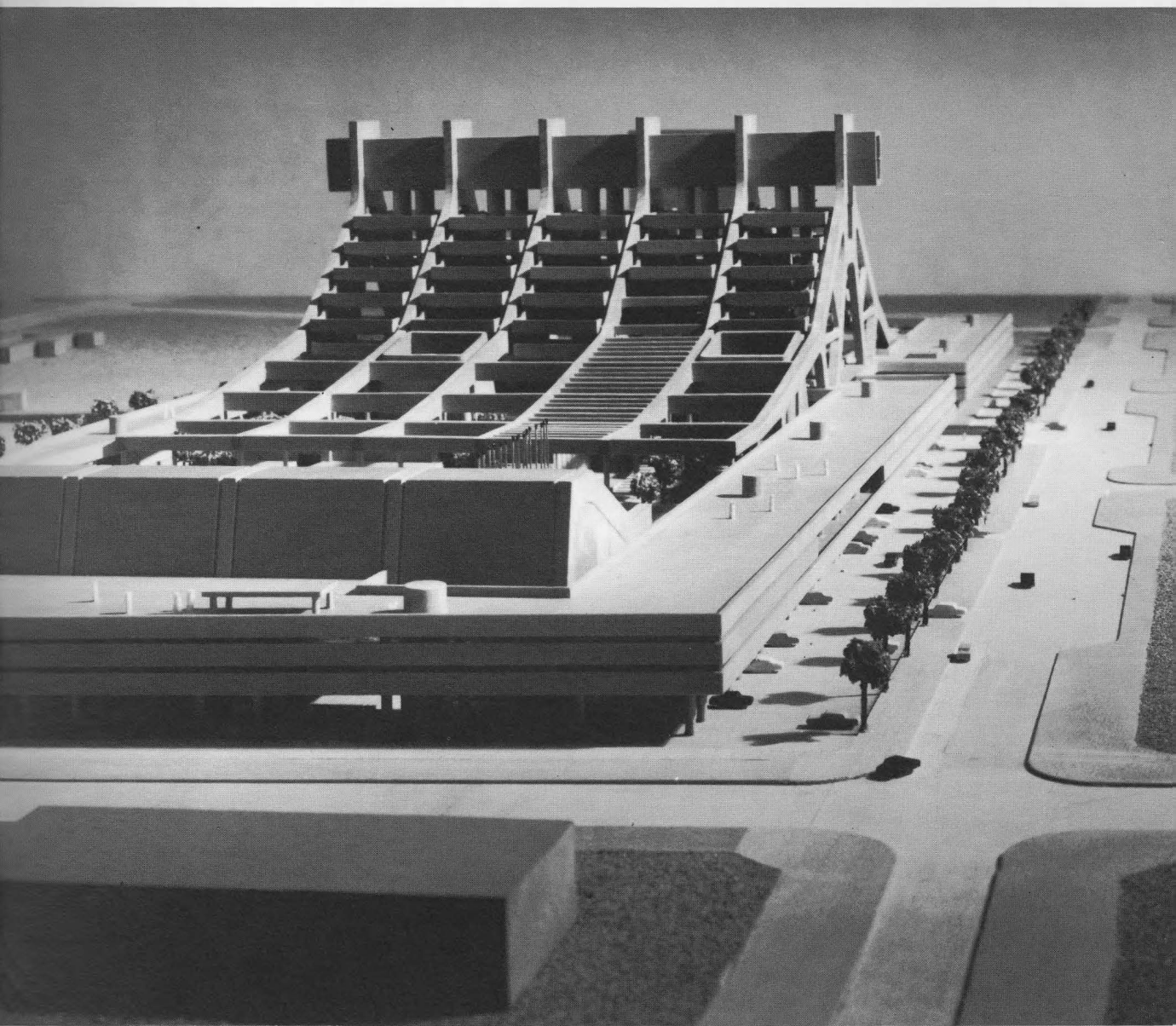
Plan indicating the corridor (*kairo*) system



Preliminary sketch of the project



Plan



Projected view from central part of city



Silhouette of the building

Conference City, Abu Dhabi, 1975

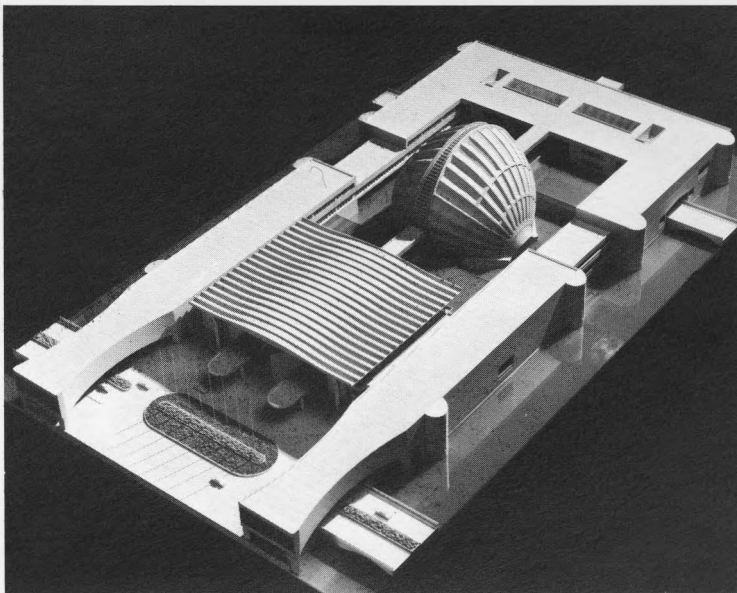
159

This design is related to the series of projects and buildings that use a system of architecture of the street (*kairo*). The official residence of the President, National Assembly, Grand Hall and residential quarters for visitors and delegations are linked by air-conditioned corridors.

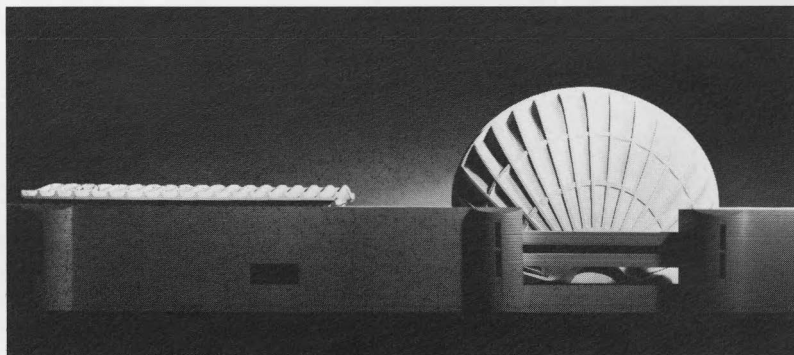
The first level is for cars, mini-buses and service vehicles, and the second level is for pedestrians. It has a moving belt in one part.

This proposal develops the concept of 'the city in architecture', as it compactly integrates different architectural works into a unified whole.

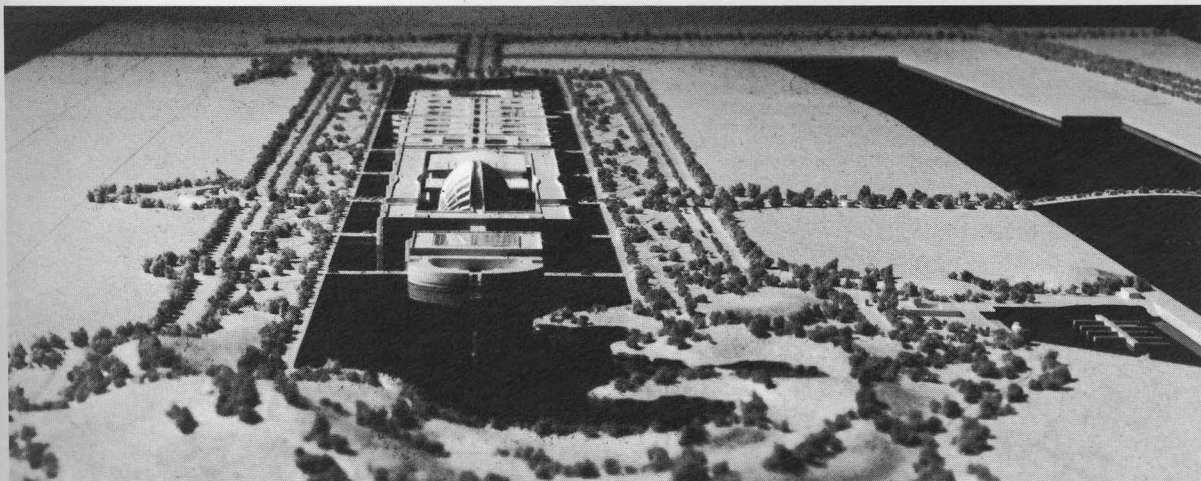
(This proposal was awarded a prize in an international competition.)



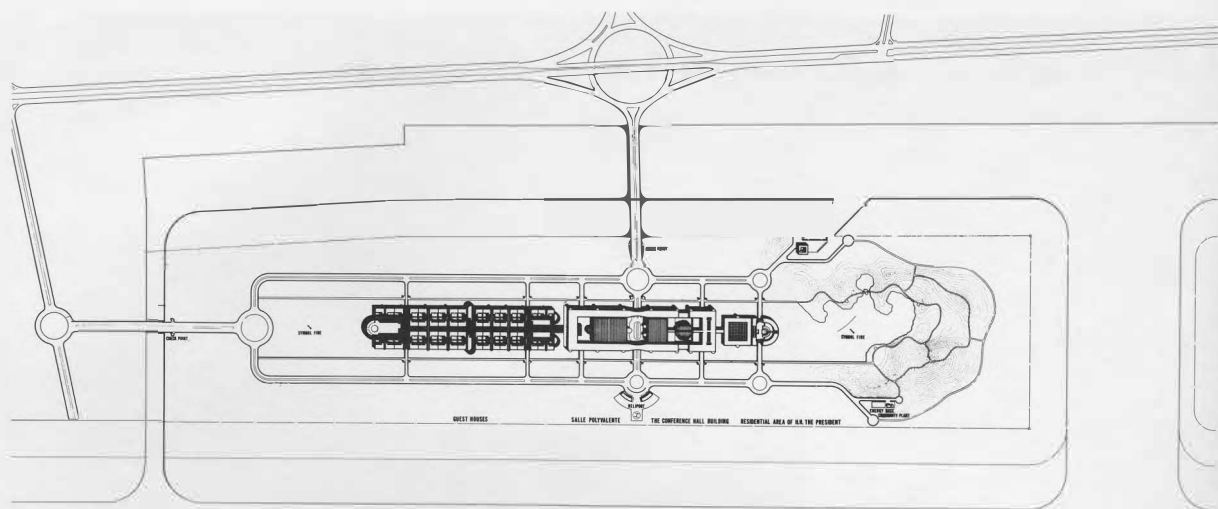
Aerial view of model



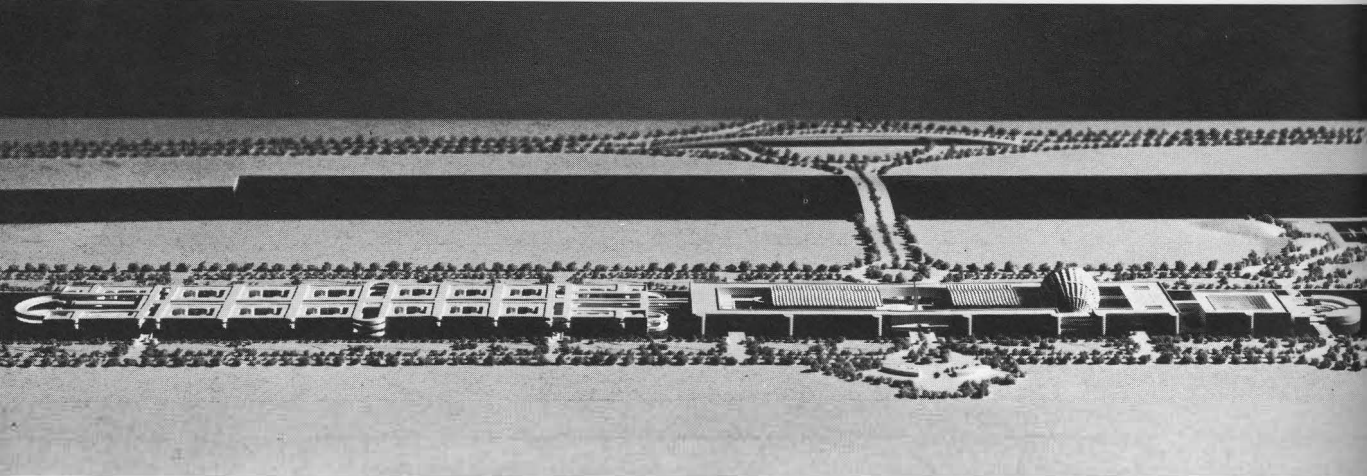
Side view



View of model showing landscaping

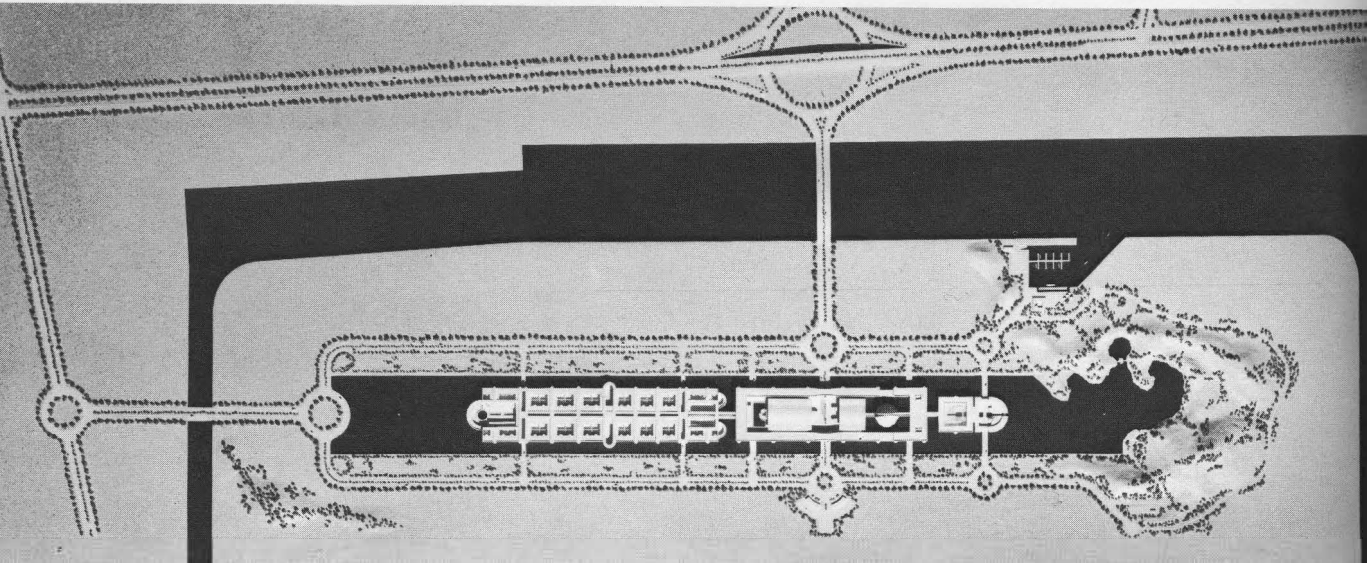


Groundplan of site



Side view of complex

Bird's eye view of model



Hotel in Sofia, Bulgaria, 1975

The hotel is to contain an authentic Japanese garden surrounded by a corridor. Along this corridor will be a shopping centre, restaurant, night-club, gallery, sports centre, and lobby

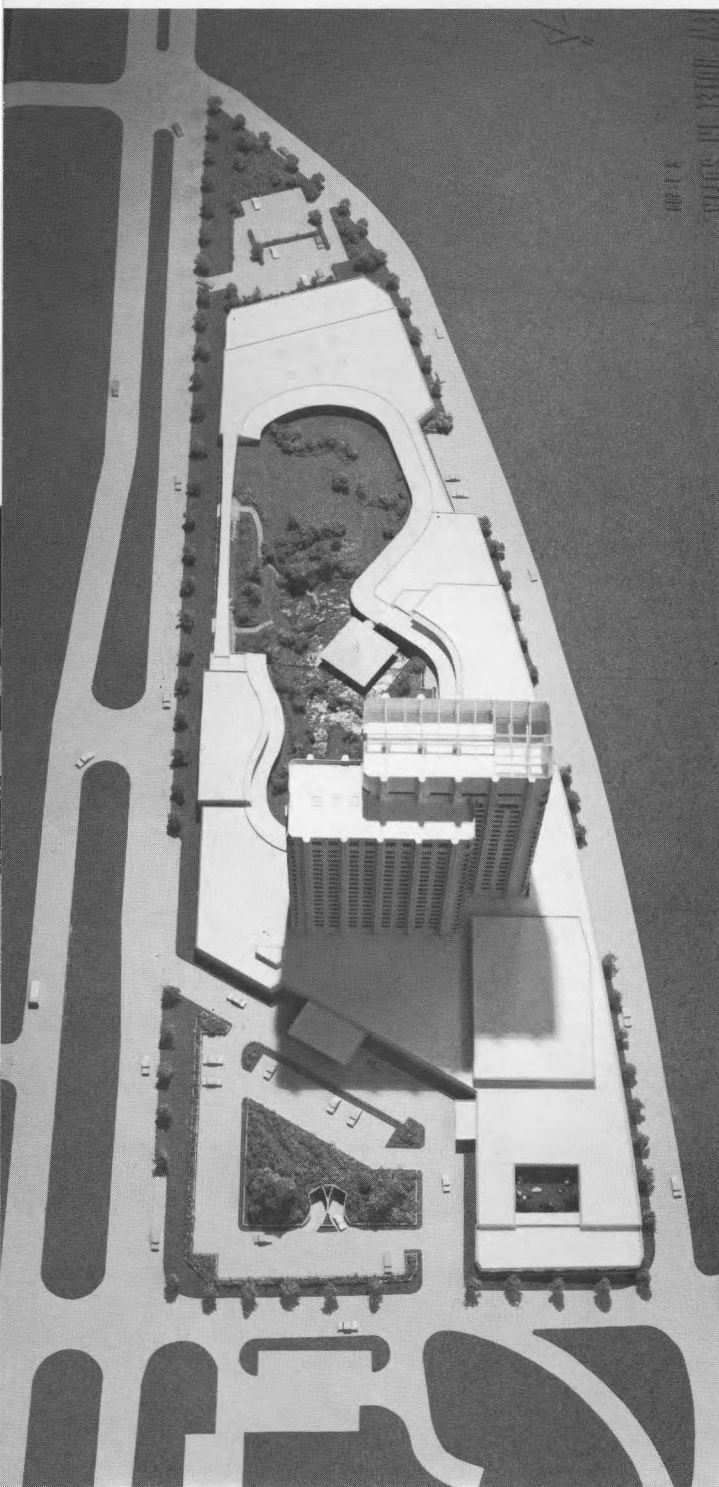
This is a form of architecture of the street through the creation of a traditional Japanese 'promenade' garden. The piping for the air con-

ditioning on the upper parts of the building is attached to the outer walls.

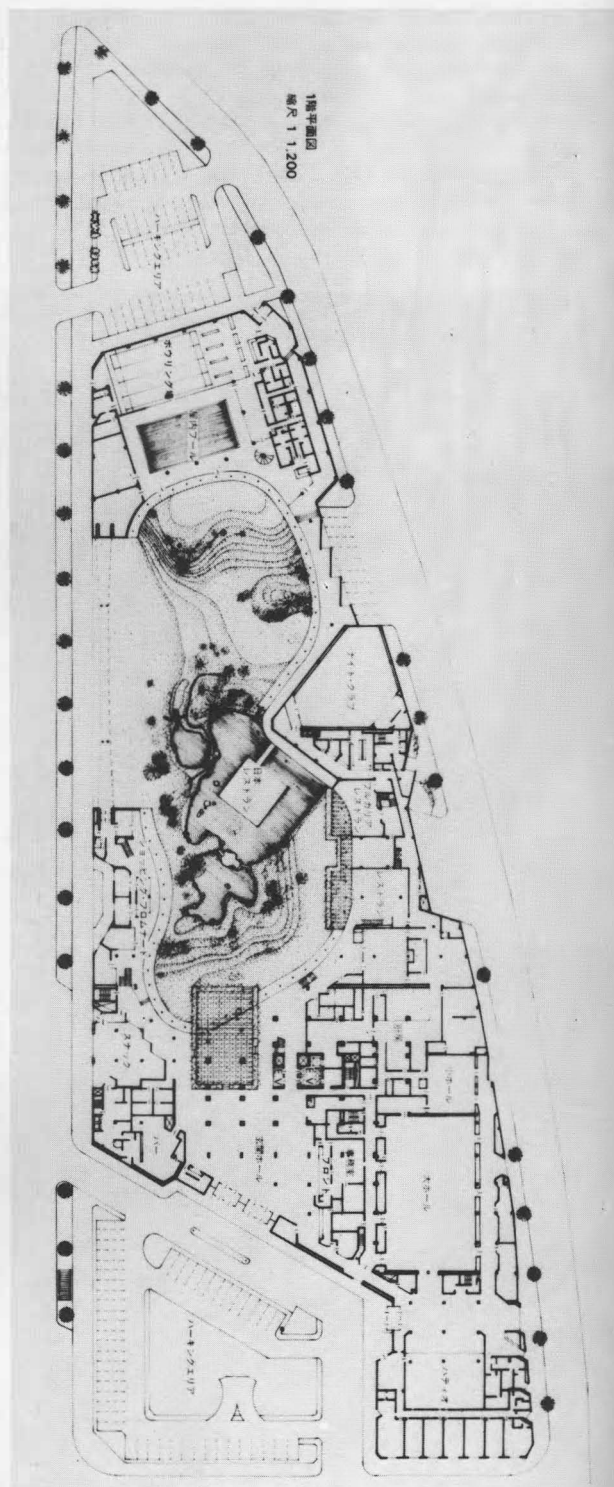
(This hotel is being built for the Balkan Tourist Agency of the Bulgarian Government. Hotel New Otani of Japan will collaborate in the management. It is to be opened in 1977.)

Façade from the west





Aerial view of model of the ground level



Plan

Azabu Town Houses, 1974

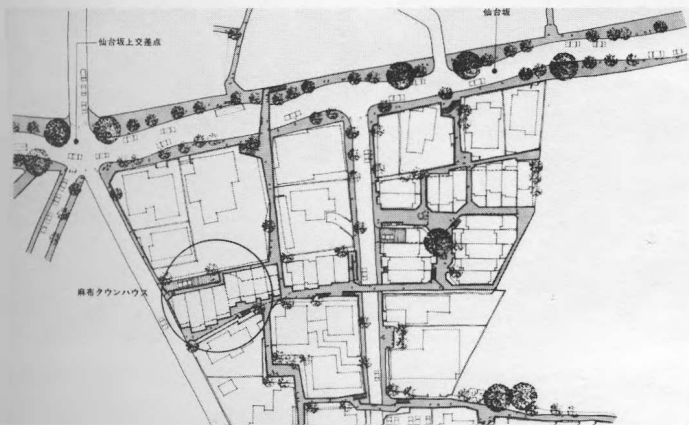
Building heights are limited to 10 or 15 m in almost all residential areas in Tokyo so as not to restrict the sunlight received by private residences. This plan is designed to serve as a prototype for low-rise, high-density housing in such an area.

A pathway for pedestrians is to run at right angles to a road open to vehicular traffic and along this a long row of attached double houses (back-to-front) will be built, each three or four storeys high.

This is a form of street architecture in which a semi-public street is to be constructed as a media space between private gardens and a public road.



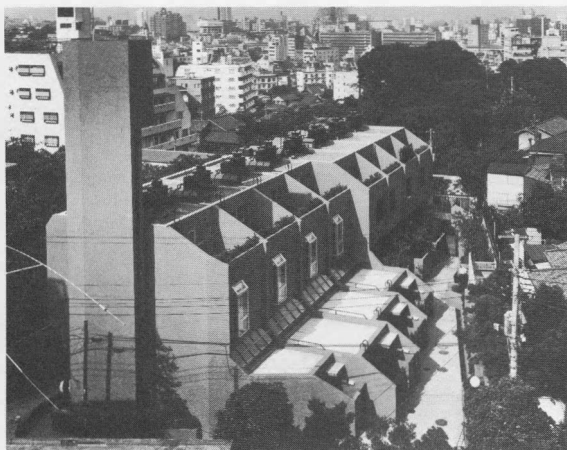
Street section



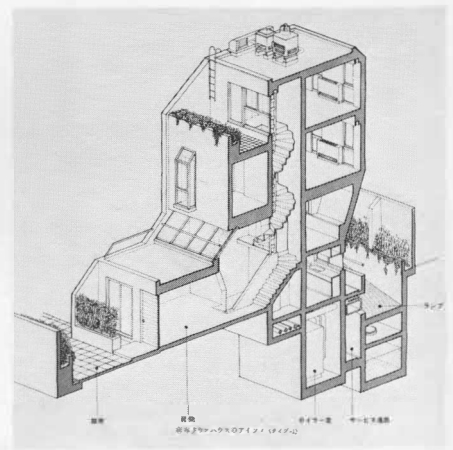
Proposal for network of pedestrian streets



Model for second stage of the project



Rear view of town houses



Isometric section of a unit

Ishikawa Cultural Centre, 1975

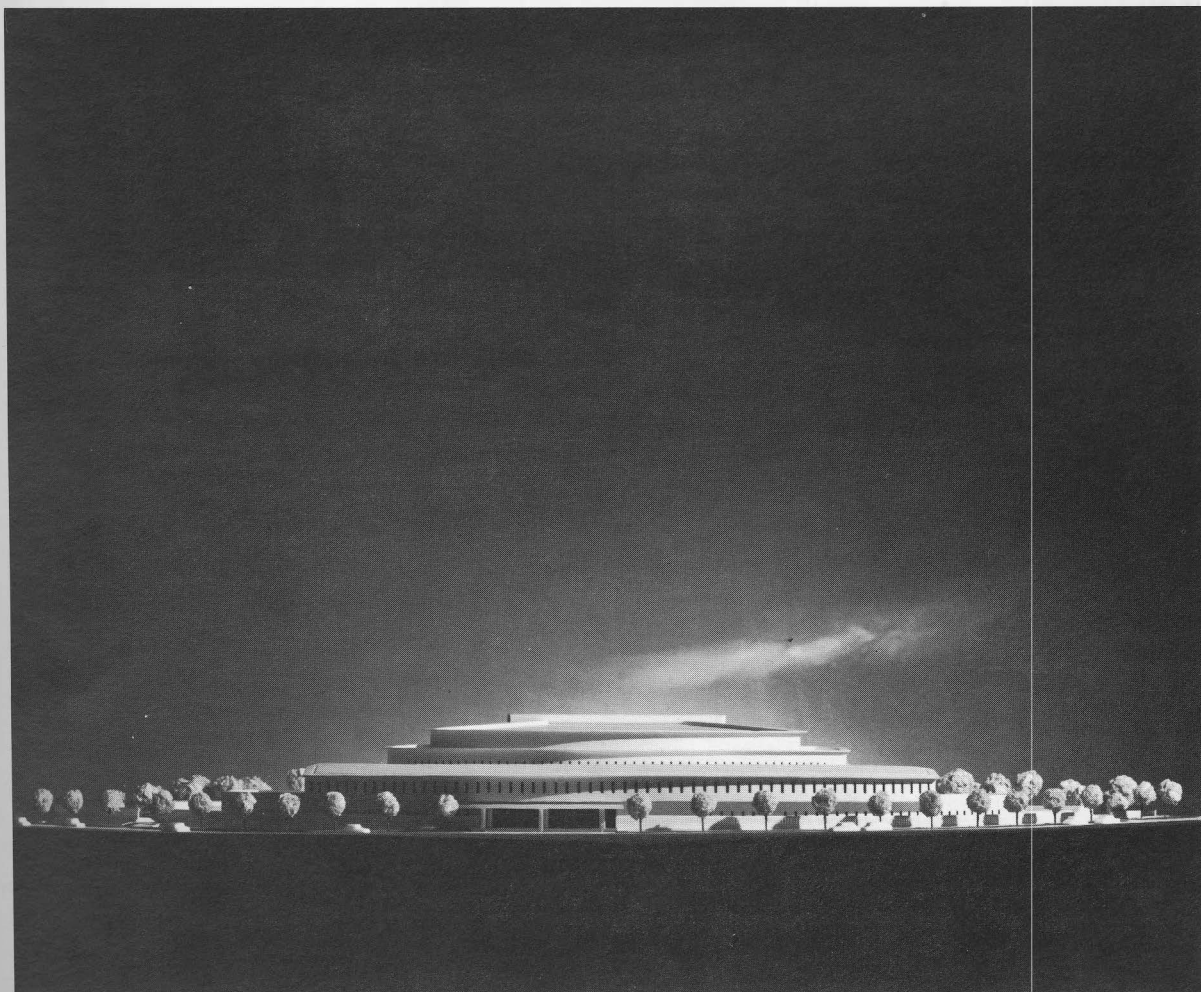
This is a design presently under construction in Kanazawa, one of the few cities in Japan which has preserved old streets in the same way as Kyoto. The site had previously been used as a baseball field and thus had an unusual configuration but rather than take this as a constraint it was exploited and the building was located as near to the street as possible. The purpose in so doing was to alter the nature of the street by architectural planning.

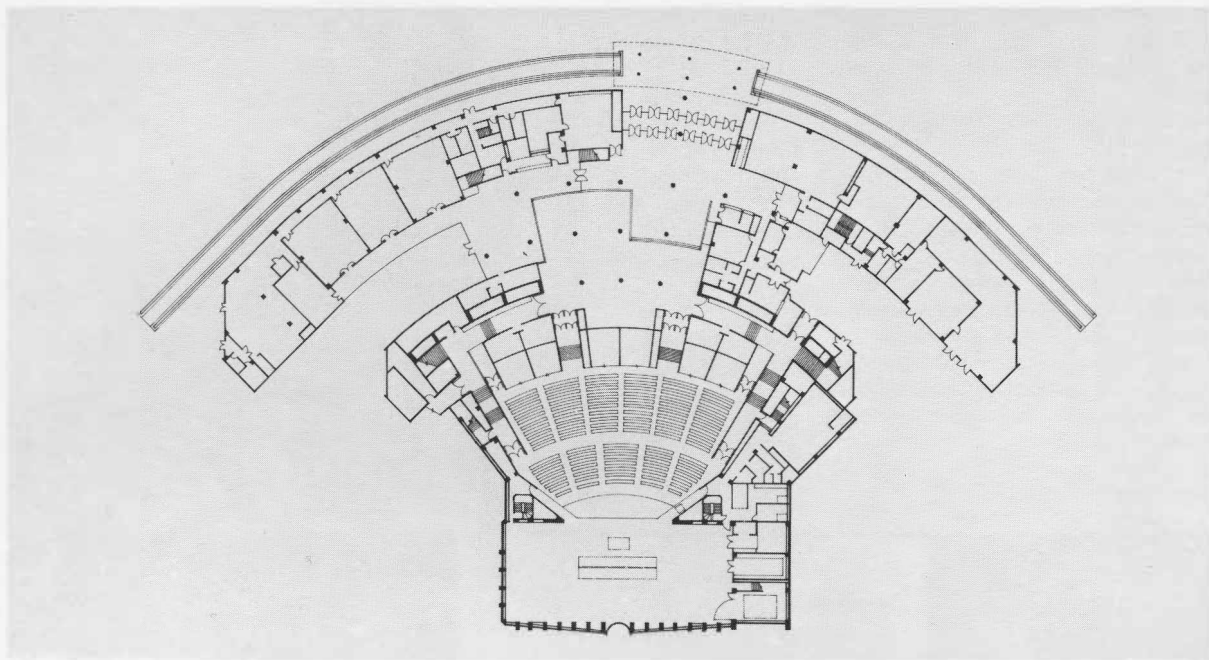
A man-made stream runs parallel to the street, with its water circulated by a pump. It has the important function of creating architecture of the street using the stream, fence, architecture and trees.

The façade and interior walls are faced with traditional grey tile, to which is added the metallic grey of aluminium and stainless steel. Grey is used to make the entire building a shadow and the stream and fence create a media space between the interior and exterior.

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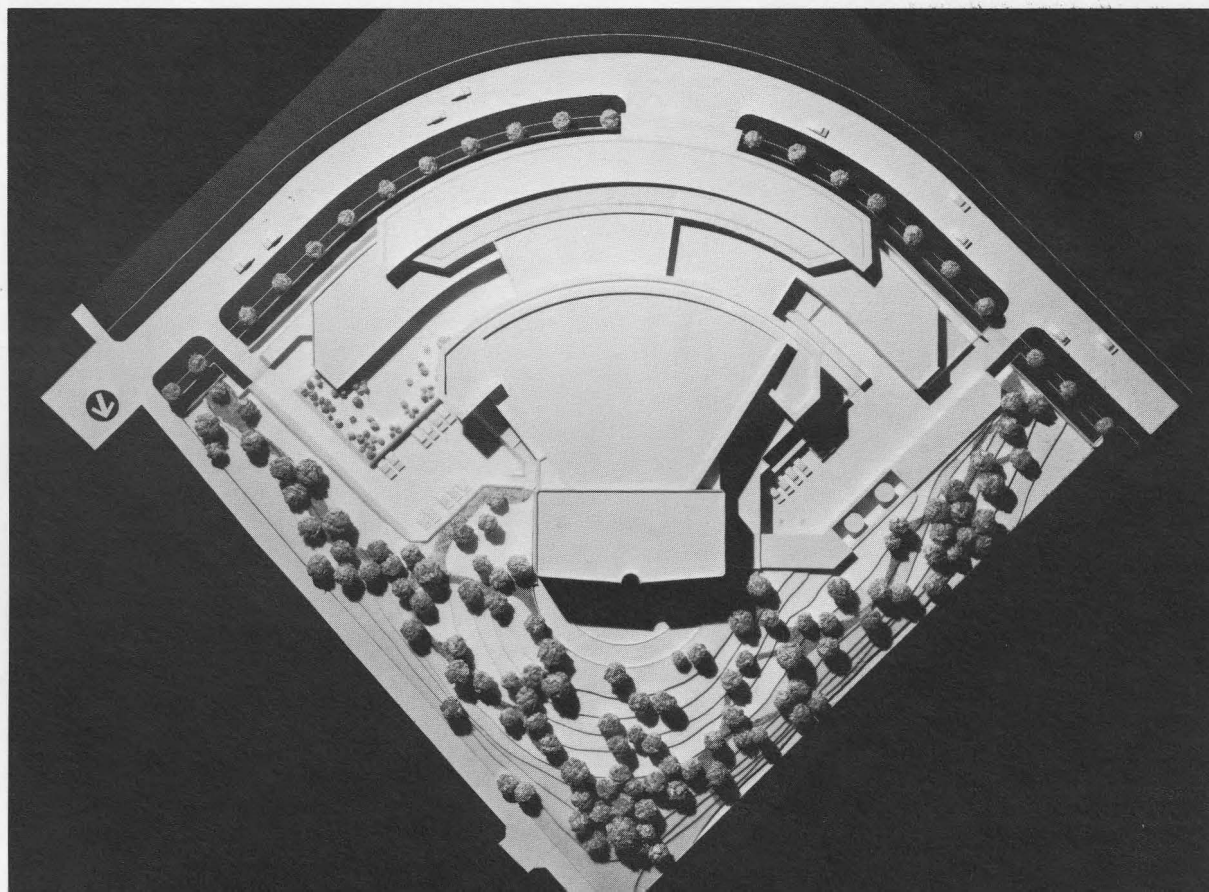
View from front





Plan of ground level

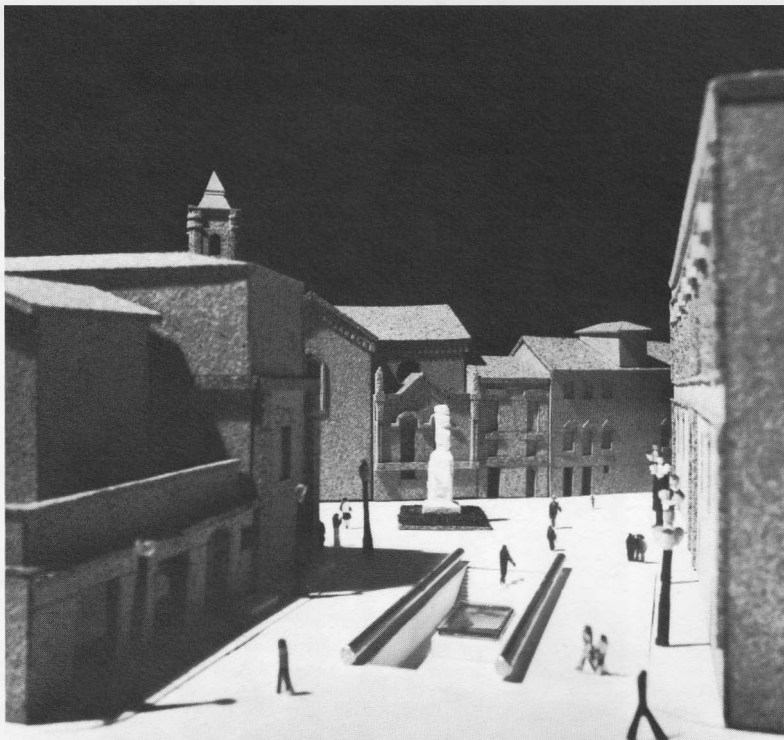
Aerial view of the model



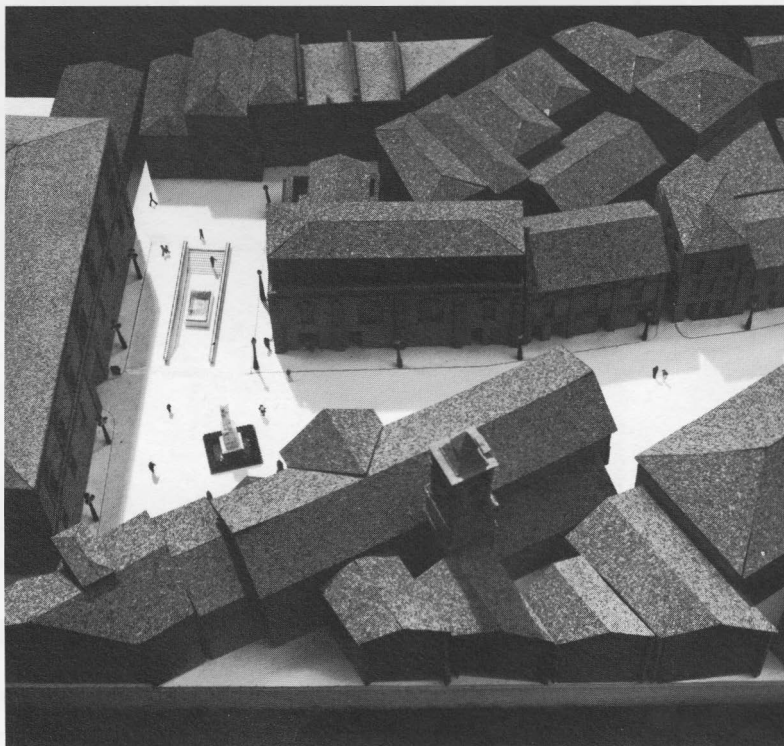
Exhibition Space, Vasto, Italy, 1975

This exhibition space for official reports and small exhibitions is planned for the square in the centre of Vasto, a historic city in Italy. So as not to jar against its ancient surroundings the entire exhibition space has been designed as an underground street in an open cut-away passage.

Only two brass pipes (illuminated) can be seen from outside, as a symbol of the exhibition space.



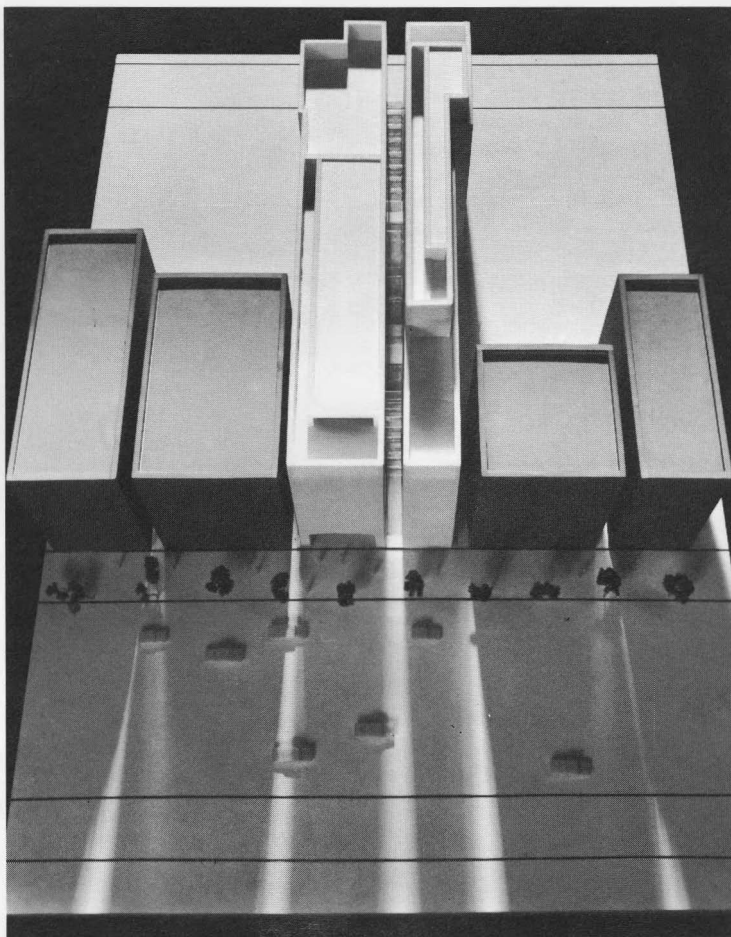
View from corner of the plaza



Aerial view of model

Daido Insurance Building, Tokyo, 1975

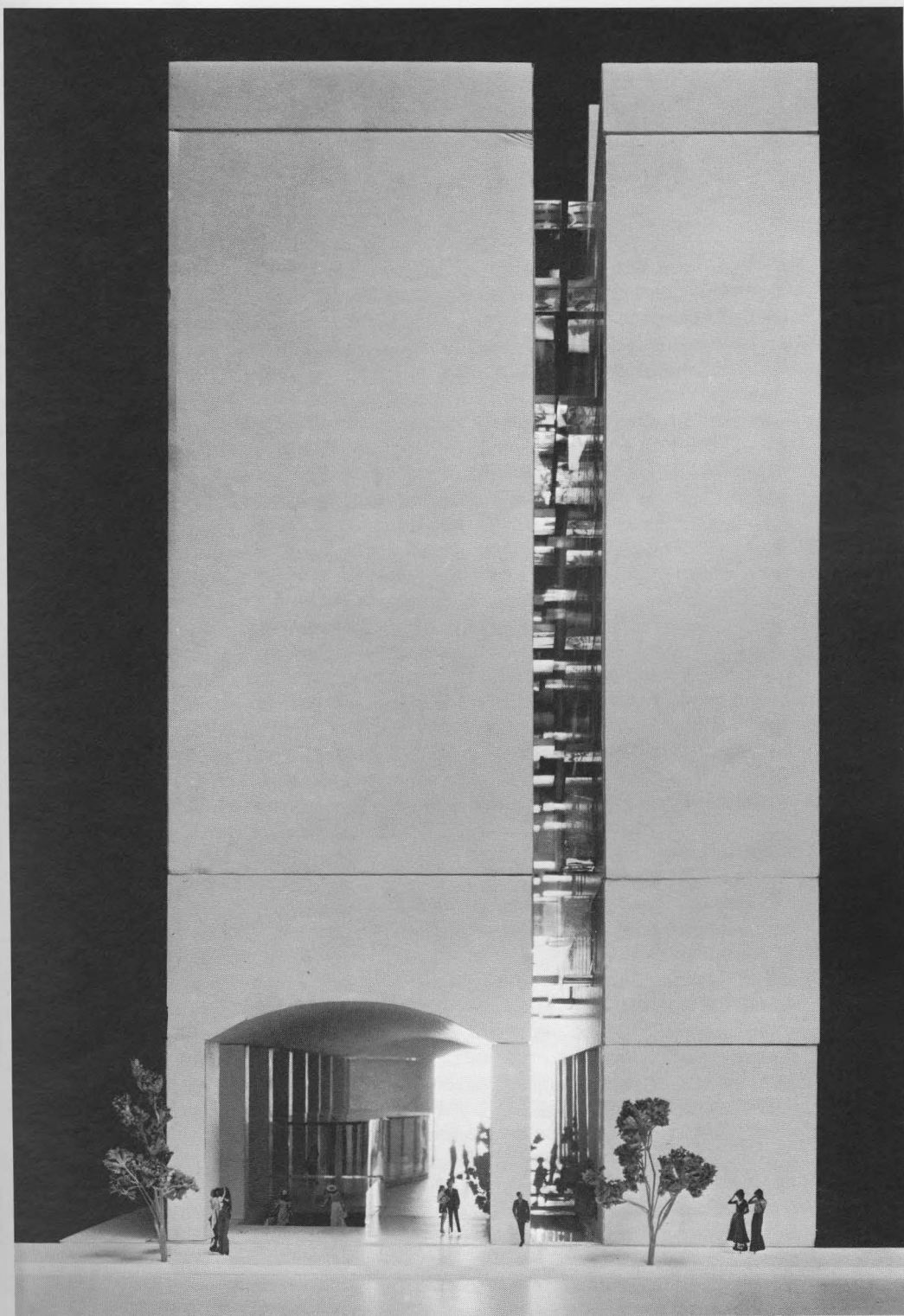
- 168 This building is divided into subjective and objective space. Light and water shows are presented in the space between and a passageway through which people can approach them has been created. This also represents a form of architecture of the street in the centre of a city



Aerial view of model



Interior of the street



Façade of model

Chapter 4

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Media Space, or *En*-Space

A series of works which were then called 'architecture of the street' or 'movement space' was started with the Nishijin Labour Centre in 1962. This was an experiment in which I sought to find out how much separate entities scattered throughout the city or throughout society could be activated by media space. I was interested not in establishing an organic whole but rather in having individual entities stimulate the whole. (This was presented as 'A Stimulation System' at the Team 10 meeting.) I also had intended to take the concept of the street which usually was taken to be an exterior space and reverse its meaning by combining it with the word 'architecture'. 'Architecture of the street' triggers in me various other words: free space, play space, meeting space, third space, the space of *ma*, media space, equilibrium zone, grey zone, semi-public space, *en*-space, feeling of common possession, expanse for shadows, or in-between condition. All sorts of words tumble forth, as if ejected from a word-making machine, the purpose of them being to expand the concept of architecture of the street, or to stimulate people to make the concept their own.

While thinking through the meaning of media space, it occurred to me that there is also a process whereby space loses its material meaning and comes to have only sensual meaning, or even to indicate introspection. Additionally, it appeared that when I created a work of architecture to be built in a city I often held an imaginary dialogue in which I endeavoured to determine how the architecture will reveal itself to other people, or what the relationships between myself and others are or should be.

Working with these two ideas, it may be possible to reveal some hidden methods, which could include such multivalent concepts as *kū* (*śūnyatā*) of Mahayana Buddhism or *gen* (chaos) of Chuang-tzū.

In Europe in the 1930s there was much discussion of the crisis and possible collapse of society and the decline in man's humanity. During that decade industrialization and mechanization began to dominate industry, in an atmosphere of increasing international unrest. The break-down of spiritual values to which World War I gave its final form had by this time already produced a comparable break-down of architectural values and gave rise to various forms of distress and doubt which matched the international atmosphere. The spiritual attitude of the 1930s – which sought to rebuild out of the depths of human existence the human person, the world, and also architecture – this attitude is still pertinent in today's world.

The process of spiritual disintegration includes internalization of the self, so that man's inward world came to be severed from the outward reality. A pathological introspective attitude arose as a result which gives rise to introversion, narcissism, sensualism or, according to Charles Jencks's classification, super-sensualism. However, in the 1930s people had already started to escape from the self-destruction brought on by spiritual

disintegration. I think that Henri Lefebvre's 'I am a glove turned inside out . . . I must escape from this prison of ice,' which expresses a desire to avoid self-destruction by transferring from the basic subjectivity of the 'self' to that of 'Other', speaks of the pain latent in the inner reaches of West European individualism.

The Nice conference of intellectual collaboration in Europe held in 1935 had as its themes 'Towards a New Humanism' and 'The Formation of Modern Man', although there was some hint of self-distrust in their slogan 'the re-building of the complete human stature of classical times'. The need to determine how to project in the social realm the wrecked and inwardly contorted self of man is still very much with us today. Perhaps it was too much to ask from CIAM that in its search for a perfect whole it could build at once an organic, unitary entity from a disorganized space.

Rather than take this as an either-or situation, I prefer to concentrate on the work process described above. Even if one refuses to recognize the concept of a whole, we may conceive of the disintegrated individual as endowed with a wish for some unity.

In the same way as the philosophical concept of 'realism' has had different meanings in the Middle Ages, in the Enlightenment and in modern America, so the meaning of 'individualism' has been determined by its historical context. When individualism is taken in the context of disintegration of the person, and in the context of the conditions prevailing in today's Japan, several characteristics emerge. One is that the process of Japan's modernization during the past century has caused the appearance of a superficially urban society, fully mechanized and industrialized, but it has also brought in train widespread personal alienation as a consequence of destruction of the rural community. We thus have cause to doubt whether modernization has been able to enhance our society's original individualism and self-consciousness.

As David Riesman points out in *The Lonely Crowd* (written with Nathan Glazer and Reuel Denney in 1950), it was historically inevitable that individualism would appear in the West. He noted that large numbers of West Europeans were gradually liberated after the Renaissance, both economically by means of the waning of the control by mercantilists over the slowly emerging middle class, and religiously by means of escaping from control within the hierarchy of the Church - thereby becoming free men. Thus freed, people motivated by *laissez-faire* principles in economics and utilitarianism in philosophy were proponents of individualism and made such fierce competitors that they appeared immoral. However, examining the internal workings of the middle class shows that in order for them to become accustomed to freedom from the sanctions of institutions and groups to which they had been bound, it was necessary for them to internalize many controls. These controls were provided by Puritan asceticism, by the Protestant ethic. These are the 'inner-directed' who are guided by internalized goals and ideals. It is my thesis that Japan attained a superficial modernization without receiving the baptism of this kind of individualism.

As Japan was modernized there was no need for reaction against religious controls as Buddhism has never possessed the organized power of the Church. Modernization also proceeded without the development of a middle class, even in the cities. The only communities formed by the citizens were agglomerations of footloose, mobile people. Because of the absence of

Western-style individualism modern times see Japan bear the bitter double burden of, on one hand, having thrown the gears of her modernization into reverse while making interminably repeated efforts to establish the self, at the same time as, on the other hand, we proceed with the work of discovery of the Other and projection of the Other to society in an intellectual climate similar to that of Europe in the 1930s when it had been realized that individualism had reached a dead-end.

The experimental activation of the individual and the projection of the individual on society strongly influenced me in designing the Nishijin Labour Centre and, also, influenced my later thought about intermediate space.

The Nishijin Labour Centre is a welfare facility for weavers of Nishijin silk in Kyoto. It was planned as an experiment, mainly by the Doshisha University, also of Kyoto. My idea was to acquire two Kyoto townhouses, back-to-back, and make it possible to pass through them from one street to the next. It was intended to form exterior space in the same way as architecture. As discussed in the previous chapter, the Japanese urban space, the street or, more precisely, the passageways under the eaves of adjacent and contiguous buildings, is equivalent to the plaza or square of European cities.

In designing the Labour Centre I realized that this was not merely a difference in form but that it represented an important difference in spatial theory, concerning the relation of the individual to the whole – a fundamental difference in thought. As an area of open space, the plaza or square may be grasped as a tangible entity with a distinct function. However, architecture of the street does not have the clear-cut boundaries of the European plaza but continues on and on, forming a time-space which has its activity in the form of ambiguous change. At the same time I realized that because the function of the street depends on various highly indeterminate conditions, it has a new type of function which unfolds haphazardly as a consequence of the actions of the people who pass through it, or the people who live in houses facing on to it, or because of the symbolic nature of the street itself. Accordingly the street serves as an extension of private or personal space as well as an extension of public space, although the balance between these two elements changes with time and with the passing of the seasons, and also varies according to region. Thus, during the early part of the 1960s the concept which was central to my work was this: since the street could be thought of as an extension of architectural space, a new approach is possible whereby the street itself is made into architecture within which various activities of daily life proceed, and, then, the street must be recognized as architectural space.

One side of the elongated site of the Labour Centre was thought of as a passageway, after the natural image of a murmuring brook. In the design this was treated figuratively as a pond. In it is a sculpture by Gyo Hongo, called *Guide-Stone*. This is to provide the image of an intersection, or of a guidepost in a passageway. Because it limits the space of the passageway the wall of the adjacent buildings becomes the façade of the passageway. In so doing the single façade that is formed is one in which existing history, or existing conditions, coexists with newly made architecture. It is then an abstract expression of coexistence of the new and the old townscape.

However, I was not satisfied with the results. Although I introduced various symbols in order to make the passageway into architecture, I did

not succeed in making it more than exterior space; there was not a satisfactory mutual penetration of architecture, the passageway, and space. The interior space of the architecture does not have the spatial quality of relatively complying with the space of the passageway which leads into it. Because in general the street is something which has been able to grow and develop through the activities of daily life, it must have the quality and disposition of urban texture, of urban material, but this passageway does not stimulate the mind. This problems caused me to reflect on this design, and to bear in mind the questions raised as I went on to later work.

Through linking the concept of the architecture of the street and the concept of awareness of nature within a building (as in a tea house) in the Yamagata Resort Centre project, I came to try a way of introducing nature into the organic structure of a building and making exterior space into architecture by incorporating elements of nature. I had the idea that by introducing the exterior into the Resort Centre's halls and public areas by making it possible to see the space outside the halls and public areas and by re-introducing natural conditions such as rainfall, I could attain a new fusion of architecture and exterior space.

Bringing nature into organic structure enriches the quality of media space, and is a convenient method of reversing the phases of interior and exterior. Before this project I had had several occasions to try to do this, such as with the Central Lodge in the National Children's Land, a recreation park for children, and the Memorial Museum for Hans Christian Andersen. In both I sought to assimilate the perception of both the interior and the exterior by means of human movement and paid great attention to space for pedestrian movement. In the case of the Central Lodge I planned for the roof of the first-floor public space to be used for pedestrians and that the interval between the three-storey portion of the sleeping accommodation and the space above the first-floor roof would be partially closed as an *en-space*, introducing landscape into it. In the case of the Andersen museum the passage is covered by glass. Because I wanted to create a white-night space, neither exterior nor interior but a grey space, I introduced light and shadow, as symbols of nature, into this area.

At the same time I was writing a book, *Homo Movens* (1969), in which I projected the architecture of the street, and urban movement space upon the image of mankind in a new age, and upon the image of society. This was intended as a way of opposing the functionalism which had been established by CIAM and other participants in the modern architecture movement, as functionalism had taken the setting for the functions of daily life as static space and had viewed movement as taking place only along optical lines within those static spaces. The theme of the book was whether the space for movement, including the depersonalized streets and modes of transport, could be reconverted to the human space which had been a quality of traditional streets. In it I wrote as follows:

The significance of 'movement space', which provides for a mixture of many uses and functions, is certain to increase in the information age in our future. Previously, I said that the future function of our metropolises is to be information centres, and movement space will be the core of those cities . . . In particular, the creation of movement space, brimming with life, will give birth to the cities of tomorrow.



What I had in mind included the thought that the concept of the community, which hitherto had been a geographically fixed living space, should be freed from that restriction, and should be built to be a place for people to meet, in which there would be space in which people move, or a venue where an entirely new kind of community would be formed. For that reason the concept of the architecture of the street and the concept of *Homo movens* can be said to be different aspects of one and the same thing.

(1) *Kairo* of Itsukushima shrine

In the *Homo movens* society the intermediate group has been of particular interest and significance to me. These are new voluntary groups arising from the growth of personal mobility which destroys the old social groupings. They are based upon common interest, sometimes religion, sometimes educational institutions, places of work, popular movements or the like, in all of which human relationships have meaning essentially different from that of the group based on blood ties and locale, as is the case with communities hitherto. Although it is difficult to define adequately what is meant by intermediate groups, or temporal communities, it is wrong to see such groups as only the sum of either the families or individuals in them.

In these voluntary groups there is not the unity of the constant whole of the past; the groups are clusters or packs of separate and mobile individuals. By helping these intermediate groups to grow and develop, we



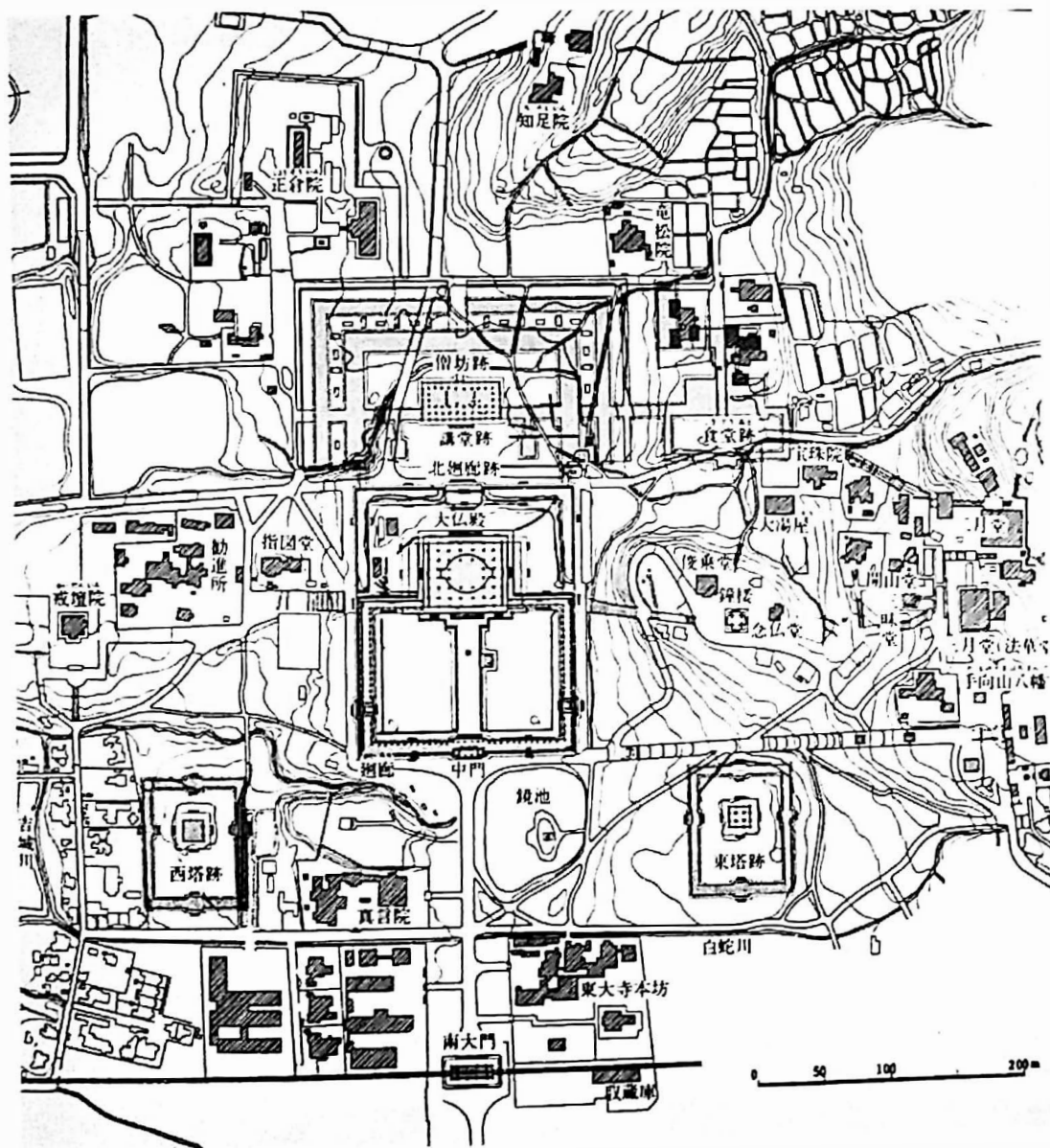
(2) *Kairo* of Todaiji Temple

can move towards remedying the defects of present society which is based on locale and blood ties and towards averting the destruction of the community. For this we need an intermediate concept, between the two poles of the individual and society.

In contrast to the way that human groups based on locale and blood ties have created regional space, intermediate groups in society, because they do not have fixed bases for securing their livelihoods, will experience difficulties in participating in the formation of space. However, the creation of media space has the potential of serving as the stage for the formation of voluntary intermediate groups. For example, the *en*-space (media space) below the overhang of the three-storey part of the Daido Life Insurance Building in Sapporo not only provides a place where snow cannot accumulate during winter but also includes a gallery which provides a small focal point for local artists to display their work. It may be said to play a part in the formation of an intermediate group. Media space in both the Waki-cho City Hall and Daido Insurance Building in Tokyo functions well in bringing into the space the scenes hitherto concealed in the town, in creating a world of white-night through the interplay of light and shadow.

Work on planning of the Fukuoka Bank began in 1972. At the time I was perplexed over how to develop the concept of media space, but fortunately I received instructions to the effect that I should produce a building which in one way or another was open to its environment. This links with the idea that in this project the concept of media space should be made into, as it were, a stage. About the same time I began working with the subject of architecture of the street and the ideal city, and the cosmology of the Indian Vedanta Sutra provided the basis for seeking the origin of Japanese culture and Japanese space in Buddhist thought.

This is because a number of most absorbing discoveries result if media space is taken as *śūnyatā* or *karma* (en). The idea of *kū* is that of the Indian *śūnyatā* and in particular is a development of the existential concept of space. When this entered China during the Six Dynasties period, it was combined with a new concept of *mu* (nothingness, absolute void) but when it was introduced from China to Japan *kū* reverted to an existential concept. Rather than describe *kū* by considering *mu* as the Chinese did, Japanese Buddhists discuss *kū* by considering non-*kū*, which means *rinne* (*saṃsara*);



(3) Plan of Todaiji Temple



(4) Traditional town house in Kyoto

our accumulated experience from birth to death. If we think of *kū* as being of tremendously great density, we may ask whether the architecture of the street and media space aside from their existence as tangible objects, do not have extremely high density – so great that man is not capable of seeing it – as symbols of spiritual activity and life.

Before starting to design the Fukuoka Bank building, in my project for Centre Beaubourg in Paris I developed the theme of the city within the city and the hill within the city. What is external is also internal, or, by reversing internal and external, it is intended that the human experiences which take place there attain a new, higher density. Reference may be made to the *kairo* or corridor system of traditional Japanese building, used in the TANU Headquarters Building, designed somewhat later. In this design the corridors have been given various functions, such as to be the infrastructure linking the administrative, legislative and other halls and rooms, and

diverse cultural facilities. But the corridors are both open to the adjacent surroundings and at the same time are closed by being roofed. While working on sketches for the bank design, I had to face the fact that the bank was located in the busiest part of Fukuoka, and that there was a high volume of pedestrian traffic to and from two railway stations in the area. Further, there was a cluster of buildings 31 to 45 metres high on the periphery of the area. I became concerned with the idea of how to immerse the bank building in this so that it would become part of the townscape. Even if the height of the building was kept to 45 metres, equal to the height of the neighbouring building, the problem still remained of how to immerse the building into its urban environment. Thereupon it occurred to me to create a space beneath the overhang (i.e., an urban roof). Because the total site area was not great, owing to the desire to create media space and to keep the height of the building at 45 metres, I was led to give the building what became its final form, that is, of an external passage (*engawa*) with an overhang above. This space is quite different from a plaza. It is an unexpected form below the overhang, creating spatial ambiguity by being both public and private, both external and internal. The question then arises of attaining continuity in the transition from the media space (and *en-space*) to the interior space. This required that the wall facing out be the least possible barrier to light, but since it was also necessary to give those inside some privacy, a lattice, such as is frequently used in Kyoto townhouses for the same purpose, was suggested, but in the end the desired effect was achieved by using semi-transparent, heat-absorbing glass. In plan, the *en-space* portion is normally a space for use by people moving about on foot. All spaces containing offices in which people move, or as in the case of waiting rooms, where they pause, front on to the plaza outside.

In order to introduce symbols of human activity into media space, various experiments were tried in this project. Among them the music hall was located underground. The music hall is directly beneath, and directly approached from, the plaza. Space is provided for exhibiting sculpture in answer to a request that we provide a place where local sculptors could show their work.

Further, symbols of nature had to be introduced, to give a feeling of the presence of nature. In a sketch made four years previously I had noted, 'I want a white tree here, or a fossilized tree.' Figuratively, because this *en-space* is only a contrivance in which people perform various acts, it is appropriate to suggest nature by abstract means. It was decided that the symbol should be water, in the form of a pool, waterfall or whatever, in addition to plants.

En-space is a self-regulated internal space within a greater private space, and on the other hand it also expresses an opening towards the outside. This sort of relationship between the inner and the outer is akin to the principle of dialogue in the Jewish philosopher Martin Buber's work, and the anti-illusion of which Takaaki Yoshimoto writes. If the plazas of the Italian Renaissance are considered to correspond to one type of illusion, shared by all humanity, that there is an abstract being embodied in the concept of 'a human being', then the *en-space* created here is only another type of illusion in that it forms a dialogue with an individual being, man, woman, father or mother.

2 Notes on Media Space (*En-Space*)

This was first published in the Japanese architectural magazine Kenchiku Bunka in January 1973. It comprises a random selection of fragments from my articles and books on media space or en-space, arranged in a montage. In including this I hope that the readers will be enabled to perceive the thought processes behind the concept of media space.

1 Notes from the Past Ten Years on Intermediary Space

Perhaps it can be said that the confusion in modern cities has been caused by a fragmentation of our experience of the environment, especially as it affects our perception of the outer space of architecture, rather than by the bewildering scale of architecture.

If streets are regarded as rivers, towns can be considered as groups of islets in the river. Is it enough for us to span bridges between our islets and neighbouring islets and to construct banks in order to prevent flood? Just as the river was an essential source of life for ancient man, the river today must become an integral part of human life again. Apart from their functions as vehicles, streets are needed again as living spaces.

What I call the architecture of the street and the architecture of the plaza are means of regaining the organic function of the cities by designing streets integrated with architecture and architecture containing streets. (*Kokusai Kenchiku*, November 1965, 'Action Architecture', Shokoku Publishing Co.)

'The physical aspect of the biological system is nothing but a sort of frame and connector of a machine. Its specific function is to carry out energy exchanges, and growth and assimilation are the means of achieving metabolism – the energy conversions prompted by enzymes.' (J. D. Bernal)

In order to integrate individual spaces into an organic system, a system is needed which can connect these spaces. This will happen with the discovery of a new function or the discovery of a new symbol . . .

When these connectors are found the traffic through them will be forms of 'amplification' and 'variation'. Connecting living space (private space) with social space (public space) may 'relay' information, including aspects of human nature, or may pave the way for 'amplification' of a feeling of togetherness.

(*Kindaikenchiku*, November 1960, 'Methodology of Metabolism')

The limit on the natural resources on earth means that a highly advanced social system will have to be built upon the principle of metabolism and mobility – an absolute inevitability in a growing society. What then will be lacking when these criteria are satisfied? – the condition which allows people to live truly humanly, which in highly industrialized societies is provided by *ma* space or pause space.

(*Kentiku*, November 1963, 'Methodology of Metabolism', 'Action Architecture')

In today's car-dominated cities, what constitutes free space?

For example, in my schemes for high-rise architecture incorporating 'meeting places', free space involves building a courtyard whose outer wall acts as a barrier against traffic space. This kind of architecture opens inwardly, and sunshine and fresh air come from within the architecture. A courtyard which is closed and protects the human being by controlling speed and energy coming from outside is a 'free space' and the space is connected to neighbouring spaces, thus expanding into urban space.

The central part of the patio housing complex seen in Jose Luis Sert's 'Patio City' is a private courtyard separated from the outside space. The hollow inner section of high-rise office buildings provides recreation space in business areas. It provides an area for relaxation, shopping, refreshment, meals, strolling about, and exercise for businessmen. In spatial terms the area is semi-closed but in functional terms it is open, with the potential for some parts to connect to neighbouring recreation spaces.

As urban space becomes more functional, more organized and more often arranged vertically, human space, free space, and spaces created by adapted natural settings should be protected to provide repose. Sidewalks evolve by connecting protected human spaces, forming spaces which connect the city with the architecture.

(*Planning Methods of Urban Design, Kindaikenchiku*, January, February and March 1961, 'Action Architecture')

The 'urban organnector' performs the function that I have been discussing. I once called this concept the 'urban connector' or media-space. The word 'organnector' was contracted from 'organic' and 'connector' because the nuances of the word 'connector' are too concrete. In some cases new concepts require new words.

Joining sections between units of different characters should not form steady transitions but aim to preserve their respective characteristics. The 'architecture of the street', which connects architecture with roads, or urban architecture, which connects architecture with cities, is the urban organnector.

(*Urban Design*, Kinokuniya Publishing Co., 1965)

In lactic acid fermentation or alcoholic fermentation, which is a dissimilating process, there is a speedy action in cells due to the activity of an enzyme. Is it not possible that an urban organnector can act just like an enzyme?

(*ibid.*)

The ever-increasing growth of the scale of human society may produce monumental spaces. When not acting as urban nuclei large spaces in abundance can create a festive atmosphere in cities, as streets, plazas, and large spaces do within architecture.

(*ibid.*)

The most important method to follow in determining urban factors is 'to marshal boundaries'.

Marshalling boundaries means placing in order boundaries or contact points where various factors which exist in every urban space conflict with

each other – the points of contact of the natural environment and the architectural environment, non-human scales and human scales, people and architecture, one area with another, and roads with architecture. (*ibid.*)

The relationship between gardens and buildings in Japanese architecture is quite flexible. Verandahs of various sizes, traditional in Japanese architecture, serve as both inner and outer areas depending on whether the sliding doors or sliding screens are open or shut.

This functional aspect becomes a system which joins nature and architecture. When new rooms are added, the total structure is united by the lines formed by the verandahs and the eaves, which remain well-balanced without losing their formative lines and functions . . .

This can also be seen as a system uniting individual rooms into the total and as *ma* spaces, a buffer zone peculiar to the Japanese use of space . . .

This *ma* space is a frequent third factor in Japanese culture. Its presence indicates how Japanese thinking is not dualistic but triadic.

'Either yes or no or neither yes nor no' – this is the third area which in architecture is neither one of two opposing spaces and in philosophy neither of two opposing ideas, which I call the grey area. This grey area plays an important role in our thinking and decision-making. When the Japanese incorporate patterns from totally different cultures into their lives, they do not connect them directly, 'plug them in', but search for a new direction, an adaptation, which will allow the new culture to coexist with their own. (*Komei Shimbun*, June 1971)

I think that one of man's greatest abilities is to be able to perceive that a condition might be neither of the two obvious possibilities . . .

Use of a grey area reflects upon the human ability to discover multiple possibilities by placing in conflict the various contradictions which man has within him. Doubt, therefore, may be the source of man's creativity. (*Sankei Shimbun*, 16 June 1971)

It may be quite natural, in these times of changing social patterns characterized by my *Homo movens*, for people to want traditional festivals as abstract spiritual symbols of their territorial communities. (*Sankei Shimbun*, 21 July 1971)

Living space can be ranked vertically, according to individual space, family space and group space, as well as horizontally.

In the vertical order, the percentage of the whole occupied by individual space and group space will grow in the future . . .

Cities develop largely because of the fundamental human desire to exchange information and make face-to-face contacts. This desire does not create a fixed community but creates multiple semi-public spaces, for the activities of compatible professional, educational and religious groups. (*Kagaku Asahi*, January 1966)

Cities will be built around information-orientated industries which have nothing to do with the production of goods.

People are drawn inexorably to cities in order to seek group events and the feelings they arouse. The city is a place where people select the information they want from an abundance of relevant and unrelated information, incidentally producing new information, thus creating new ideas. Communication and separateness create close and complex relationships

in this type of environment. Curiously, something like this was foreseen in the futurist city of *Città Nuova* by Antonio Sant' Elia and in Art Nouveau.

This kind of city, then, is a world where the function and structure of spaces and human nature form an inseparable montage . . .

We need then to create cultural openings in this montage, to design *ma* spaces for cultural interaction inside the urban area.

(*Kikan Geijutsu*, Winter 1968)

Nowadays people know that Newtonian physics is not the only way to understand the earth and the universe. Riesmann's concept of space, Heisenberg's uncertainty principle, and Einstein's theory of relativity are better means by which to look at the universe and understand space.

Just as in defining the relation between space and time Einstein demonstrated that the areas between substances are not 'empty' spaces, so oriental philosophers have perceived a third concept – the vital being, man – between two totally different concepts, 'heaven' and 'earth', thus regarding the universe as a three-phase composition of heaven, earth and man . . .

In order to produce enriched spaces in modern cities, the first step should be to give streets and public areas substance. In other words, to create them as architecture. Spirit and body, man and machine, and nature and art, which have thus far been viewed as two opposites, will coexist harmoniously, after the 'empty' space between the two extremes has been carefully analysed.

(*Flower Arrangement of the Ohara School*, September 1966, 'Concept of Metabolism', Hakuba Publishing Co., 1972)

According to Dr Eiichiro Ishida, the mentality of the Japanese people is the 'spirit which does not classify'. I call this being 'in-between'.

(*Homo Movens*, Chuko Shinso Library Series, 1969)

A feature of contemporary society is that social problems become more individual and yet at the same time more universal. Hence there is the danger that the individual will become alienated by the split between individual information and public information. In order to avert this danger, a contemporary 'meeting place', or information centre should be created in Japan, similar in function to the old well where people used to gather to chat.

Information-oriented cities are spaces which connect the divided elements in human relationships. An information centre is a spatial unit which can implement such a connecting system.

(*The Future of an Information-Oriented Japanese Archipelago*, Daisan Bunmei Publishing Co., 1972)

Visual objects, for instance streets and architecture, have distinct boundaries. The inner and outer areas of architecture are divided by the outer wall. And streets and sidewalks are clearly divided by kerbs. But in such an environment composed of clear-cut sections, human life drifts around the boundaries – and the human consciousness and the human spirit in particular function beyond these boundaries.

If living space where human consciousness plays a major role is to be the main characteristic of the environment, we must find in our physical environment a new area suitable for such spiritual and information-orientated activities.

Recognition of this leads to the consideration of boundaries – those between sign and symbol, man and technology, migration and settlement, and private space and public space. The problem of an *en* system, or connecting system, based on Eastern concepts may therefore be the main subject of my future research in looking for solutions to the various problems of information space.
(*ibid.*)

A way of life which the Japanese share with the Chinese is the 'philosophy of *shakkei*' (landscape borrowing). It expresses itself in, among other ways, building gardens so as to use mountains and trees outside as an integral part of the scheme. But for people to borrow a natural environment, as it were free of charge, is too comfortable, too easy. All plans for urban development and conservation of nature which are designed to borrow nature free of charge have been influenced by this philosophy and reveal the Japanese dependence on and desire to be pampered by nature. Such an inflexible position presents serious obstacles to the development of public property and public spaces in Japan . . .

The density and high level of culture in downtown human spaces and the character of these spaces offer something like the excitement of a hive. They cannot be developed by the administrative systems of national and municipal governments, but by the wisdom and management of the local residents.

I totally agree with the new policy of banning automobile traffic from narrow streets. The next step will be to transfer ownership of the streets to the local residents and develop public spaces controlled by them. Such new public spaces can be called semi-public or intermediary (media) public spaces to distinguish them from conventional public spaces.

Furthermore, public spaces in future cities should be created as public spaces for both local residents and private groups visiting and using the areas.

(*Photo*, Prime Minister's Office, September 1972)

'The Baroque as the eternally feminine.' – E. d'Orse

I am fascinated by d'Orse's concept. He regarded the spirit of the Baroque as like an indecisive woman who does not know what she wants to do, who says both yes and no at the same time. *The Ecstasy of St Theresa* by Bellini at the Basilica of Santa Maria del Vittorino, *Noli me Tangere* by Correggio at the Prado Art Museum, *Ecstasy* by Sodoma and *A Battle Between Turks and Christians* by Tintoretto, all present the feminine form attracting while refusing, crushed with grief while happy.

In the West, the Baroque period may have been the only age in which science and art, the logical and the illogical, merged harmoniously. Perhaps all the arts of prophecy are more or less Baroque.

The traditional Japanese aesthetic is characterized by a materialistic and epic spirit based on attention to objects. The eternal nature of *makoto*, truth, which was stressed in the *Kojiki*, the chronicles of ancient Japan, defines an aesthetic of perfect confidence in things as they are, including nature. *Mono-no-aware*, the 'pathos of things' famous from the works of Fujiwara Toshinari (1114–1204), a major writer of *tanka* (a genre of short poem), and Yoshida Kenki (1283–1350), a unique essayist, traditionally implies the discovery of beauty through sadness, but when expressed in contemporary terms it suggests a transcendence over things.

Over the centuries *mono-no-aware* has gradually developed into *aware* (pathos), *yugen* (the subtle and the profound), *wabi* (a taste for the simple and quiet), and *sabi* (elegant simplicity). Has the Japanese aesthetic consciousness moved from ethos to pathos in the course of the transition?

I cannot feel at ease with these concepts, with an aesthetic of *hie* (non-passion), *kare* (fully matured), and with the *wabicha* (the tea ceremony's taste for the simple and quiet), all concepts which were formed in the latter part of the Middle Ages.

The Buddhist aesthetics of the Jōdō sect of Buddhism positioned between *mono-no-aware* and *wabi* may provide the necessary philosophy. The teachings of the Jōdō sect originated with its founder, Hōnen-Shōnin, and were developed by Shinran-Shōnin. Their special characteristic is the repetition of a three-word prayer, *Senjaku Hongan Nembutsu*. As this is designed for easy practice in daily life the sect does not postulate separation between the secular and the ideal. Praying in this way to the Buddha when one strays from the path of truth uncovers a place in the soul akin to that of media-space in architecture.

Long ago Buddhism forbade the eating of meat and the marrying of priests. Yet for some time even these edicts have been in a state of flux, as the eating of meat and the marriage of priests are commonly accepted. This state of flux belongs to the existential spiritual realm.

Studies made of *sabi* by Masayoshi Nishida play an important role in my theory. On the whole I agree with Nishida's thinking that *sabi* is the dialectical synthesis from the confrontation between the aesthetics of nothingness and the aesthetics of existence; if *wabi* is the ideal perfection, the goal, of a detachment from things or an aesthetic of absolute nothingness.

Although there is much of importance in the work of Zeami (1363–1443), a leading Noh drama writer and the composer of a still-famous Noh song, the *Yōkyoku*, in which *yugen* is expressed in terms of a flower, and in the work of

Fujiwara Teika (1162–1241), one of the greatest *tanka* poets, in which *yugen* is expressed with *tsuya* (lustre), the true successor to the *Jōdō* sect aesthetics is Basho (1644–94), perhaps Japan's most famous *haiku* poet.

Basho believed that after realizing *satori* (spiritual enlightenment), man should return to everyday life, returning to the secular way free from all obstacles. 'Elegant simplicity as expressed in Basho's poems is indicated by the colour or lustre of his *haiku*' according to Mukai Kyorai, one of Basho's students in the seventeenth century. How vivid this description is! Basho's concept of the *haiku*, a concept called *Fueki-ryuko*, that it should unify fundamental unchanging eternity with momentary and ever-happening motion, portrays the eternal and the temporal existing in the same space simultaneously.

Basho further saw mutability and self-abandonment in such a way that he considered travelling to be a form of dwelling. This relates closely to the concept of *Homo movens*, where man is seen to be able to uncover unchanging conditions in nature and peace of mind in travelling. It is here that studies of the spiritual realm of media-space begin.

'Italian opera on the night of a conspiracy.' This phrase is as perfect as 'the noble savage', a completely abstract concept of man, which Rousseau advocated. I must remember this phrase. (From a memo for *Comments on Architecture*, March 1972)

I had an extremely useful discussion with Toshinao Yoneyama, assistant professor of cultural anthropology at Kyoto University, in the part of the Amagi Conference devoted to society and social subjects. My idea that a 'time community' forms through the media space that is produced in urban space corresponds to Professor Yoneyama's ideas on 'organized groupings' as a multitude and non-organized ones as gatherings. An important concept is the fact that this media space is not merely a classical community plaza or square but is a space for voluntary, casual human relations. If the subject of the group community mentioned by Mr Fujitake (of Japanese Broadcasting Company's Communications Institute) is examined in more detail, it will also be found to relate to media space. (From a memo for the Second Amagi Conference, November 1971)

It seems to me that the cost-benefit method presented by Tadao Uchida, professor of economics at Tokyo University, could be debated further. If the method aims to take social cost into consideration, the overall cost factor will be impossible to measure. Therefore, depending on what standard you use, benefit creates changes in the standards of measurement.

Perhaps the meeting point between cost and benefit may be the media space in modern economics.

At the level of the family, how should this 'multitude' concept proposed by Prof. Yoneyama be considered? It is necessary to refer to the discussion on stabilized emotions.

'The science of life', an ambiguous system proposed by Shuhei Aida, assistant professor of systems engineering at Electric Communications University, relates to the concept of media space. To explore the problem of media space within the social system more thoroughly, I must treat the problem of a new type of social capital. The common property of individuals, groups and communities is formed from intermediary capital or wealth. This requires a study of the property inheritance system and the

tax system, involving the formation of individual capital or assets. I think this intermediary social capital stock theory might relate to a transition from 'borrowing the landscape' to 'lending the landscape'.

(From a memo for the Third Amagi Conference, November 1972)

The theory of hypnotic trances proposed by Hideo Itokawa deals with emotional stabilization in the hypnotic and neutral condition. I am opposed to allowing this theory to be developed as a religious idea. If I were asked whether my theory of media space suggests media space at the conscious level or at the psychological level, I would have to say that it indicates media space under conditions in which the spirit and the body are united.

I earlier discussed the grey area with Prof. Tadao Umesao, and our talk came to the subject of creativity, comparing this grey area with the function of the frontal lobe. However, I doubt that a 'hypnotic trance' will ever produce a creative mentality, even though it is a free state.

(From a memo for AIM meeting, November 1972)

To discover media space as an urban space, we can remove the vocabulary of architectural space into the dimensions of urban scale to make new concepts. Therefore: roof becomes urban roof; corridor becomes urban corridor; hall becomes urban hall. And the terminology of the natural environment can be replaced with that of urban space: hill becomes urban hill; urban roof and urban hall are architectural representations of a plaza or square; urban corridor is an architectural representation of a street; urban hill is a penetration of nature, into the city space.

Media space is a shadow of the substance. Reflection of consciousness. A hollow filled with passions.

(2 December 1972)

Head Office of the Fukuoka Bank, 1975

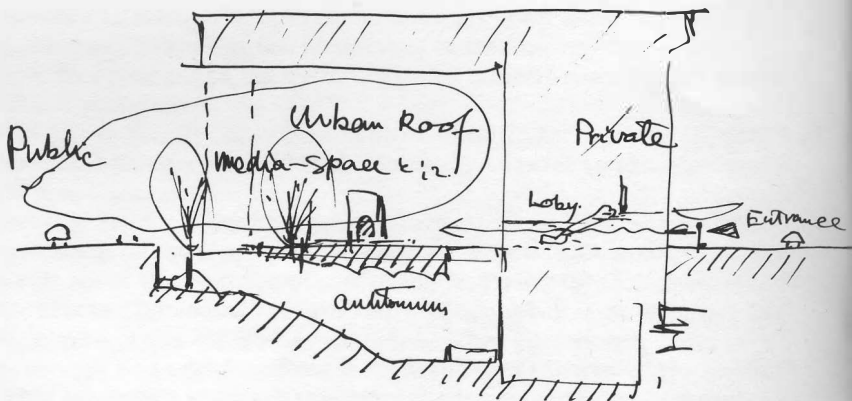
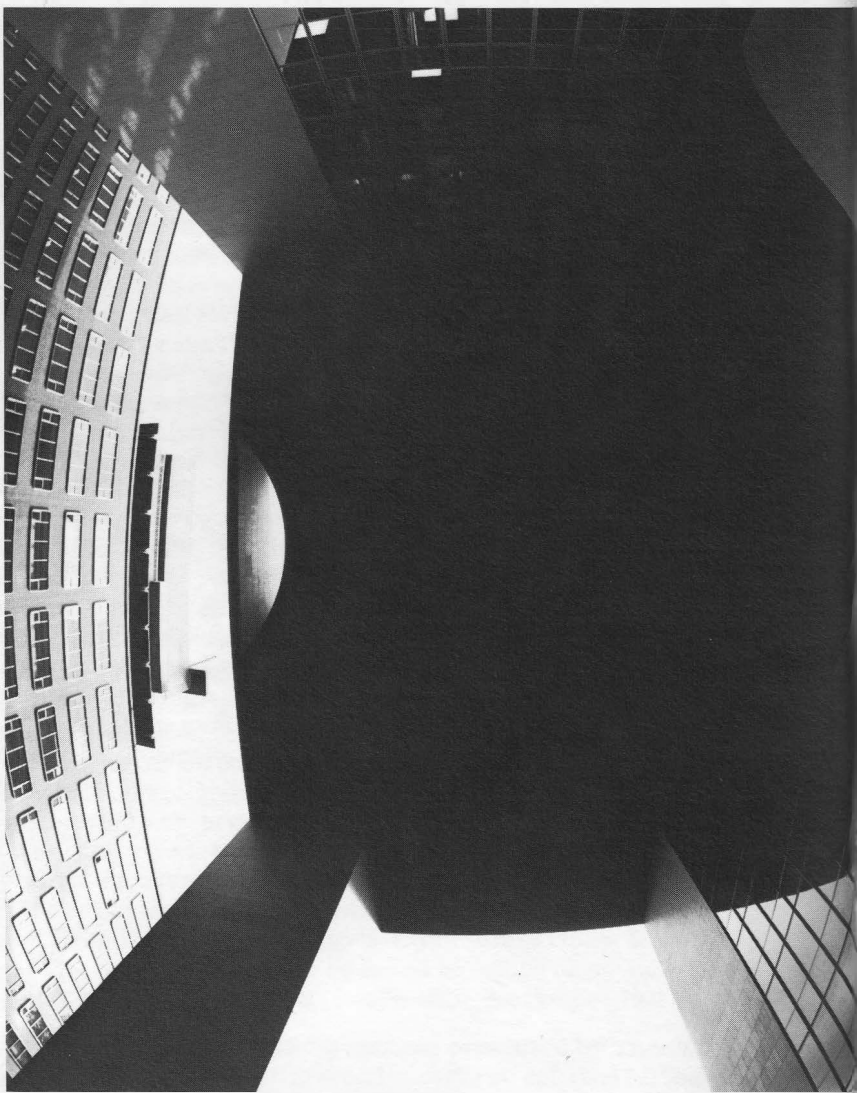
188 The Bank is located in the heart of Fukuoka with railway stations, office buildings, department stores, government offices and a hotel near by. The height of the building is the same as that of the surrounding office buildings (45 m), and an open space is provided under the roof in the form of a semi-public space resembling a public square in Western Europe but located in private space.

Traditional Japanese buildings have semi-public spaces located in private areas, *en*-spaces and covered (under-the-eaves or overhang) spaces. These spaces form a continuous order with nature, gardens and the city, which are the exterior spaces outside the building. Open space is also considered as *en*-space. Various types of trees are planted in this *en*-space and it is used for exhibitions of the work of local sculptors.

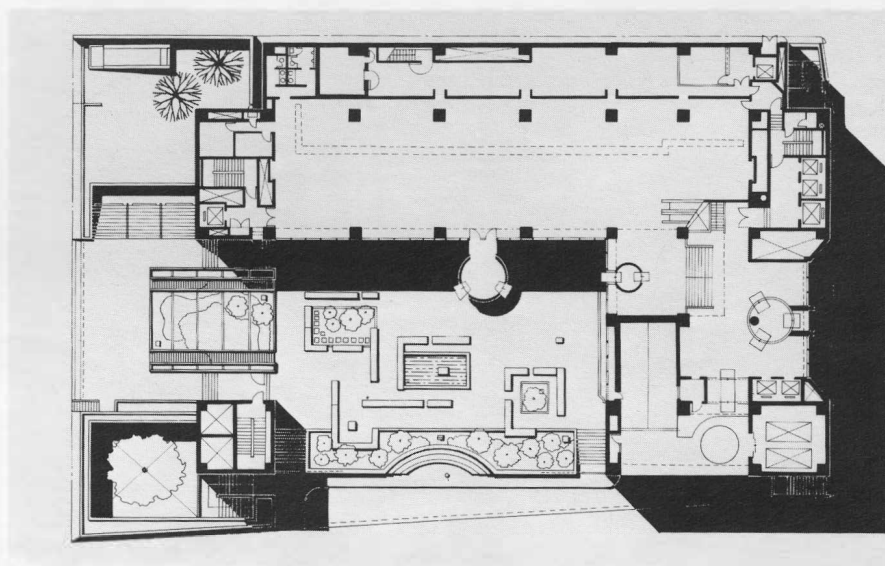
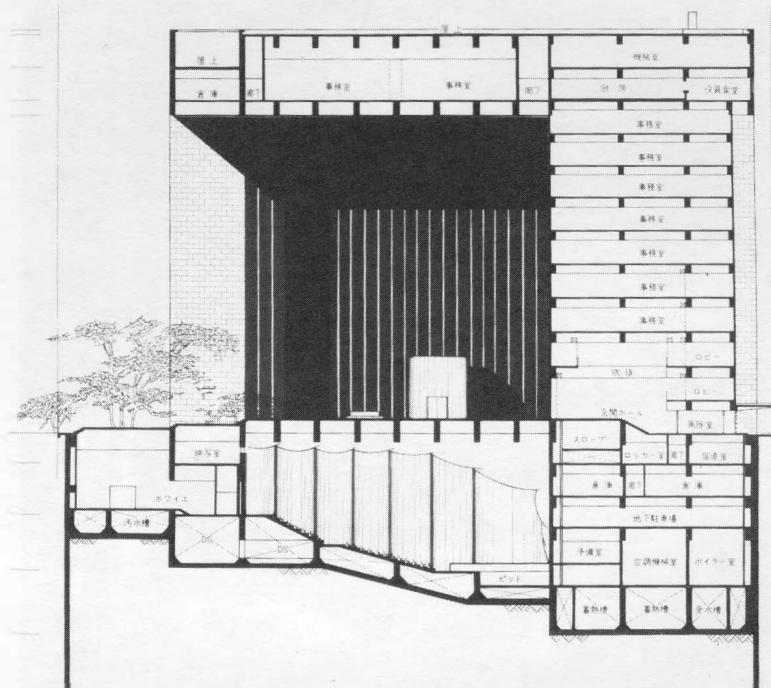
Under the *en*-space is a music hall which can accommodate 800 people.

The outer walls of the building are grey Angola granite. The colour grey is a symbol of the 'in-between' type building and it serves to dispel the impression of size. A grey building is a 'shadow' building.

View from below to roof 34 m high

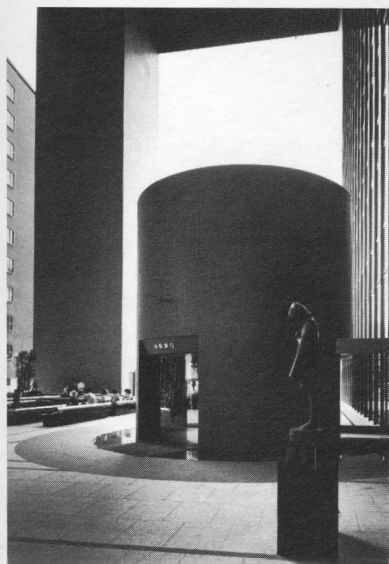


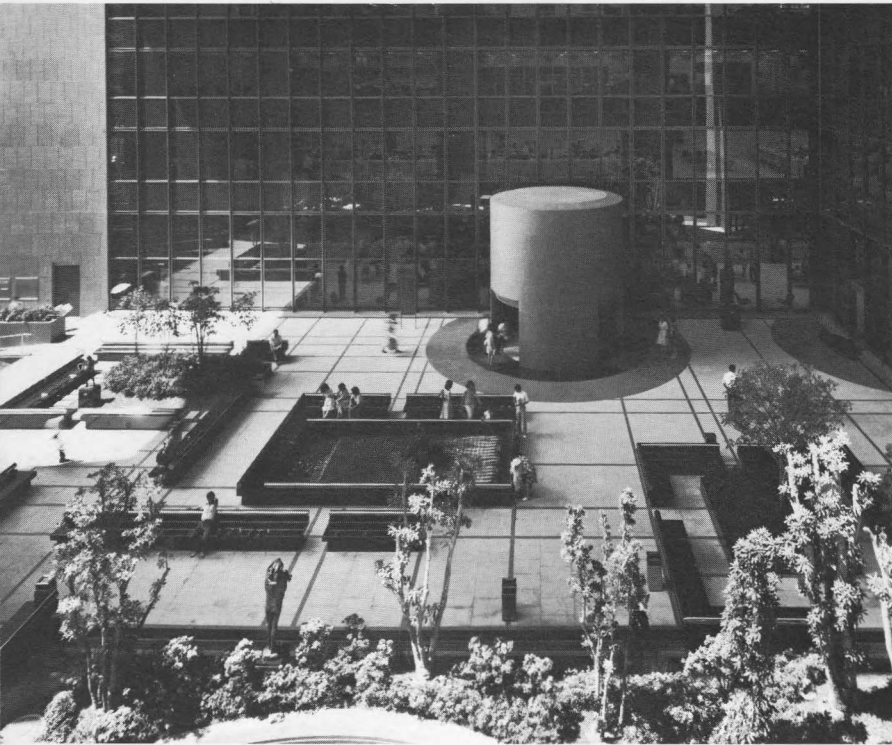
Preliminary sketch



Plan of ground floor

Main entrance



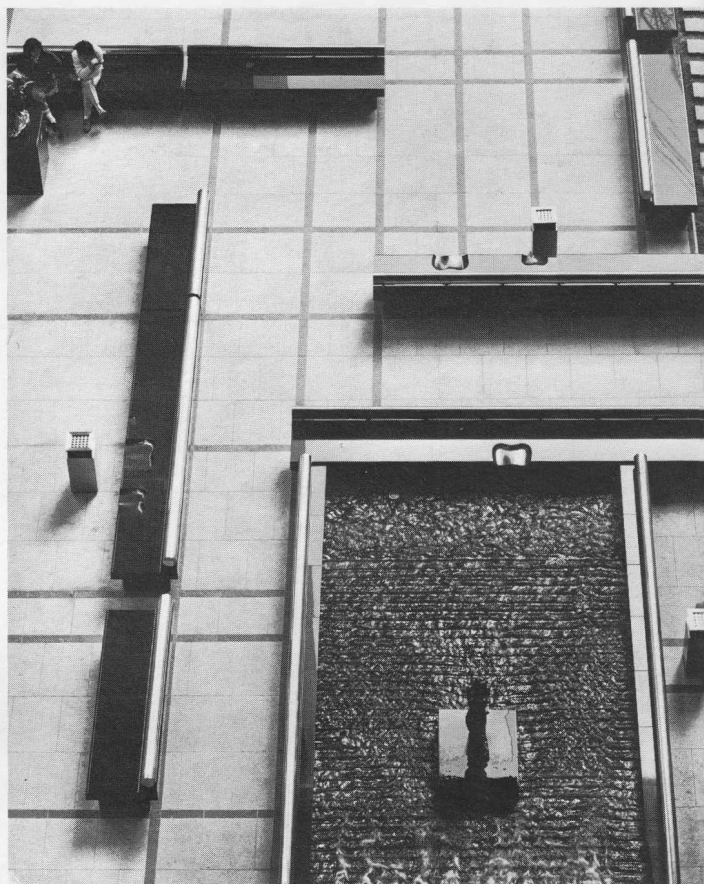


En-space with stone bench, pond, trees and sculpture

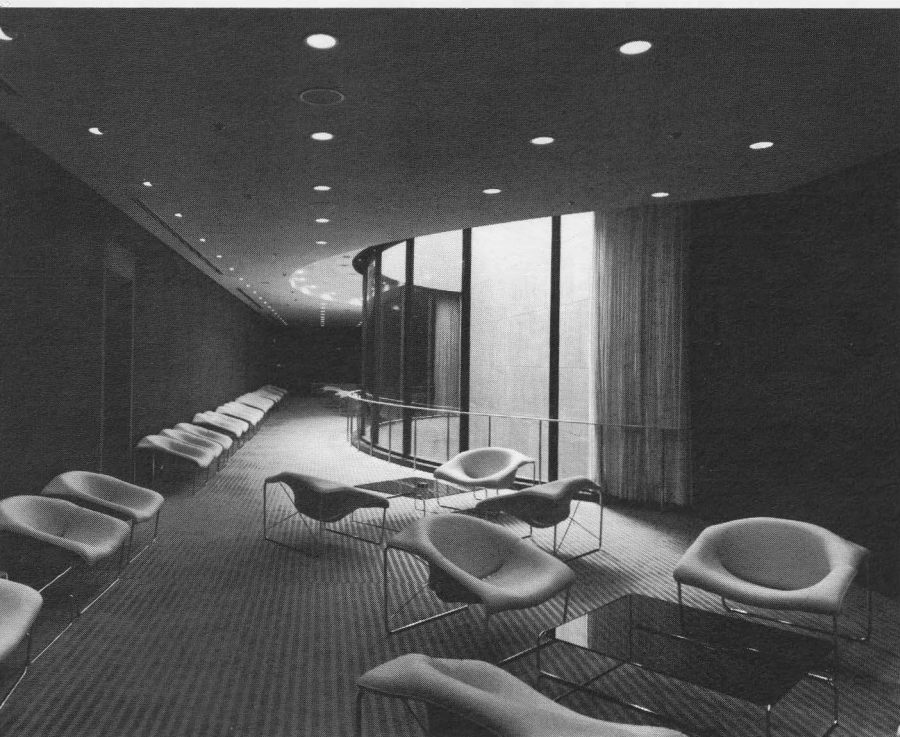


The *en-space* is usually crowded

Detail of stone bench and pond

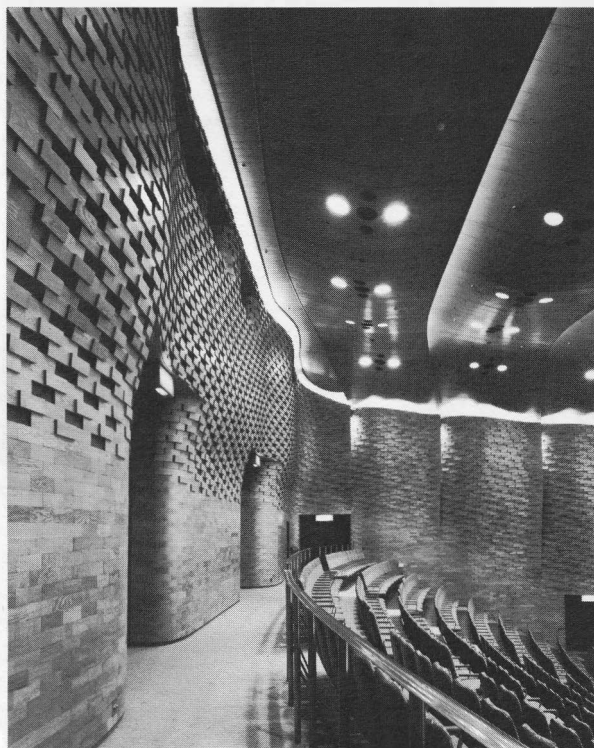


Façade from sunken garden



Lounge

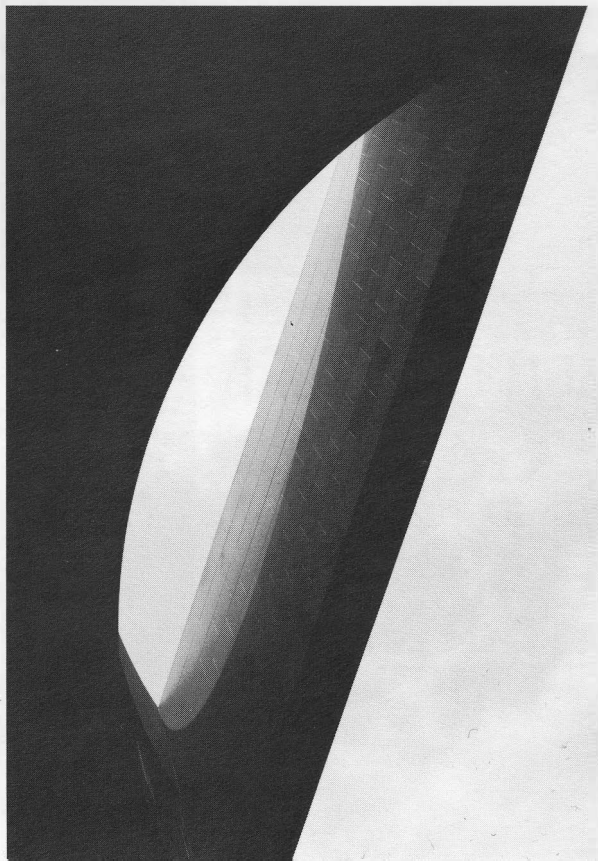
Auditorium showing wall covered by pinewood





VIP room

Detail of roof, showing gap that provides light for the lounge



Sagae City Hall, 1967

194 There is a conference hall in the lower level with the main entrance on a raised level above it. The space between the lower and upper administrative levels is an in-between space to separate administrative and legislative functions. There is also a large open space.

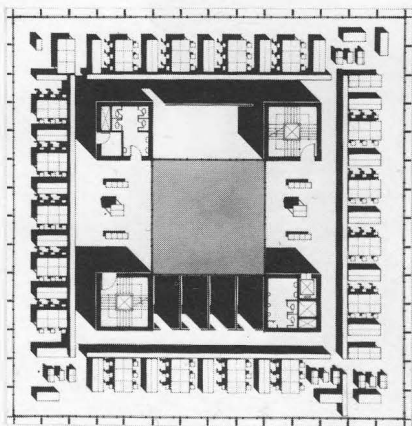
The floor of the upper level is suspended from the upper beams by high-tension wire.

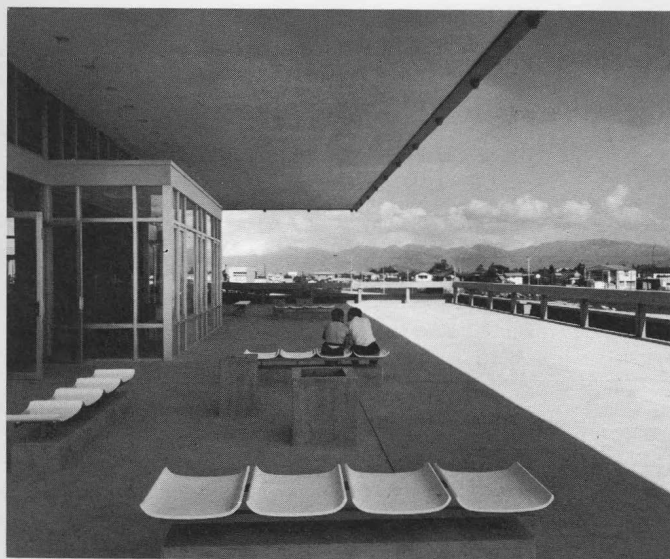
The centre part surrounded by four core shafts has light wells up to the ceiling and there is a media space connecting to the open space on the first floor.

Sagae City Hall, 1967



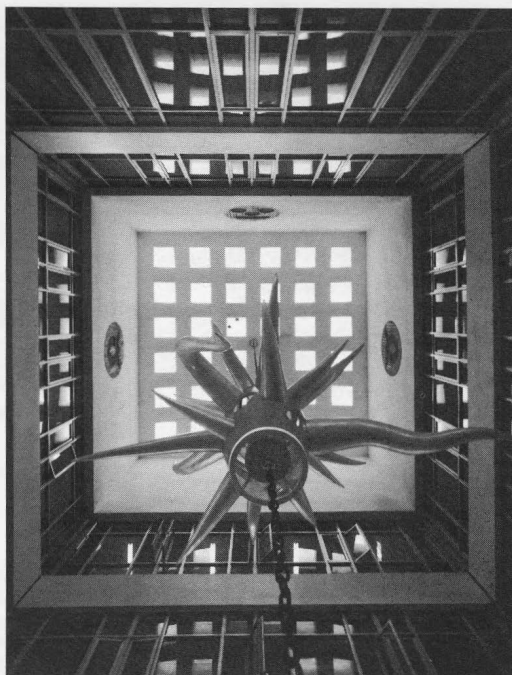
Plan of the top floor



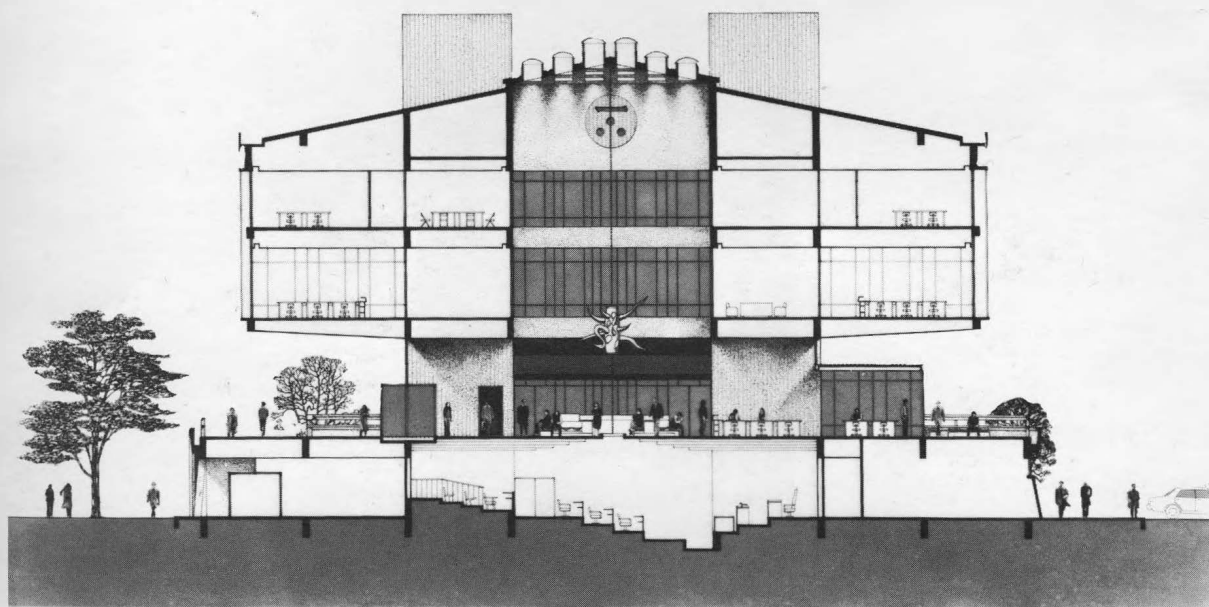


Half-covered *en-space*

Section



The central part of the building is lit by light from above which is then changed to either side



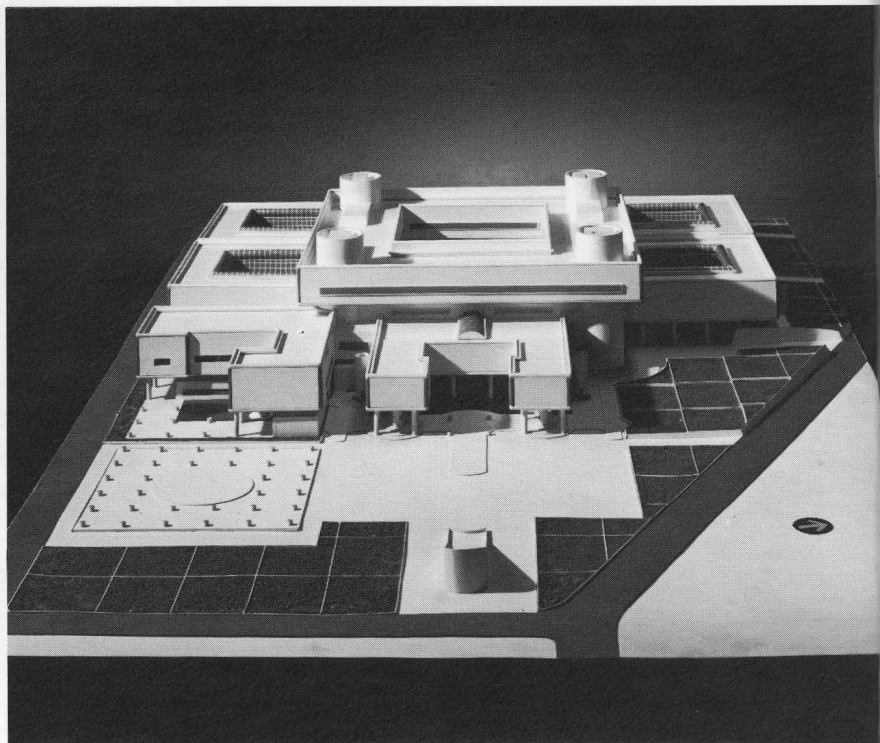
National Ethnology Museum, 1975

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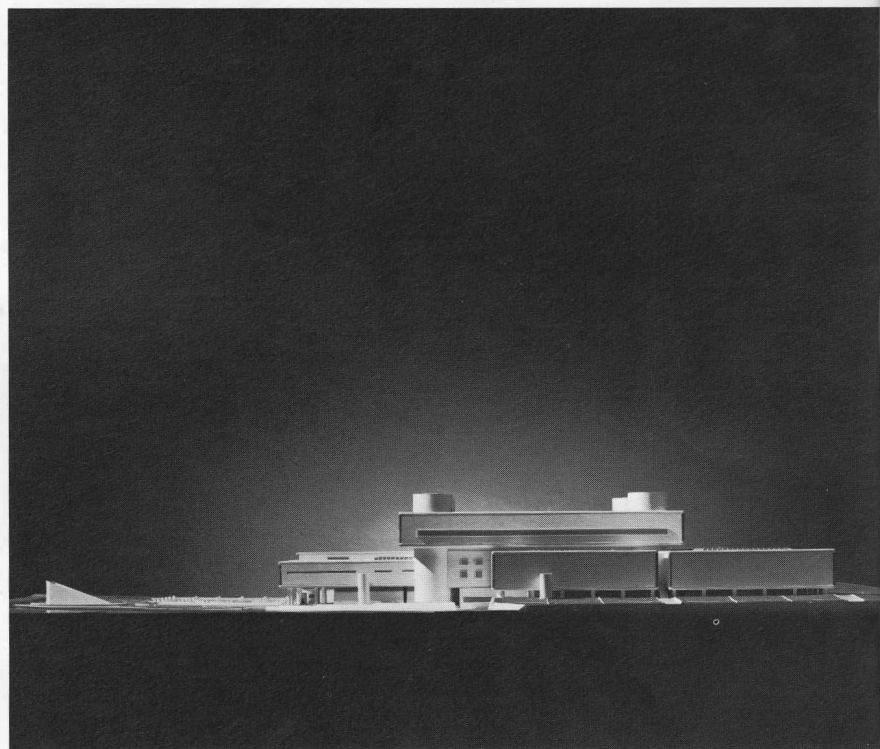
Light wells are located in the centre of the exhibition blocks arranged in the grid. The amount of light is automatically controlled by electronically driven shutters.

The lines of flow of the exhibits form a grid structure. The building is also in the form of architecture of the street.

(This building is not only to be a public museum but also an ethnology research centre to be used by the national universities. An information capsule which has video equipment for ethnological data retrieval is to be included. It is planned to open the museum in 1977.)

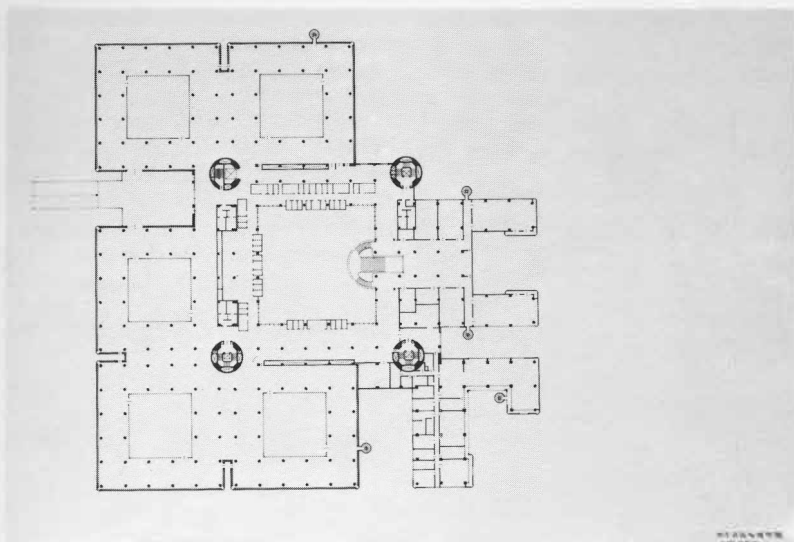


View from main approach

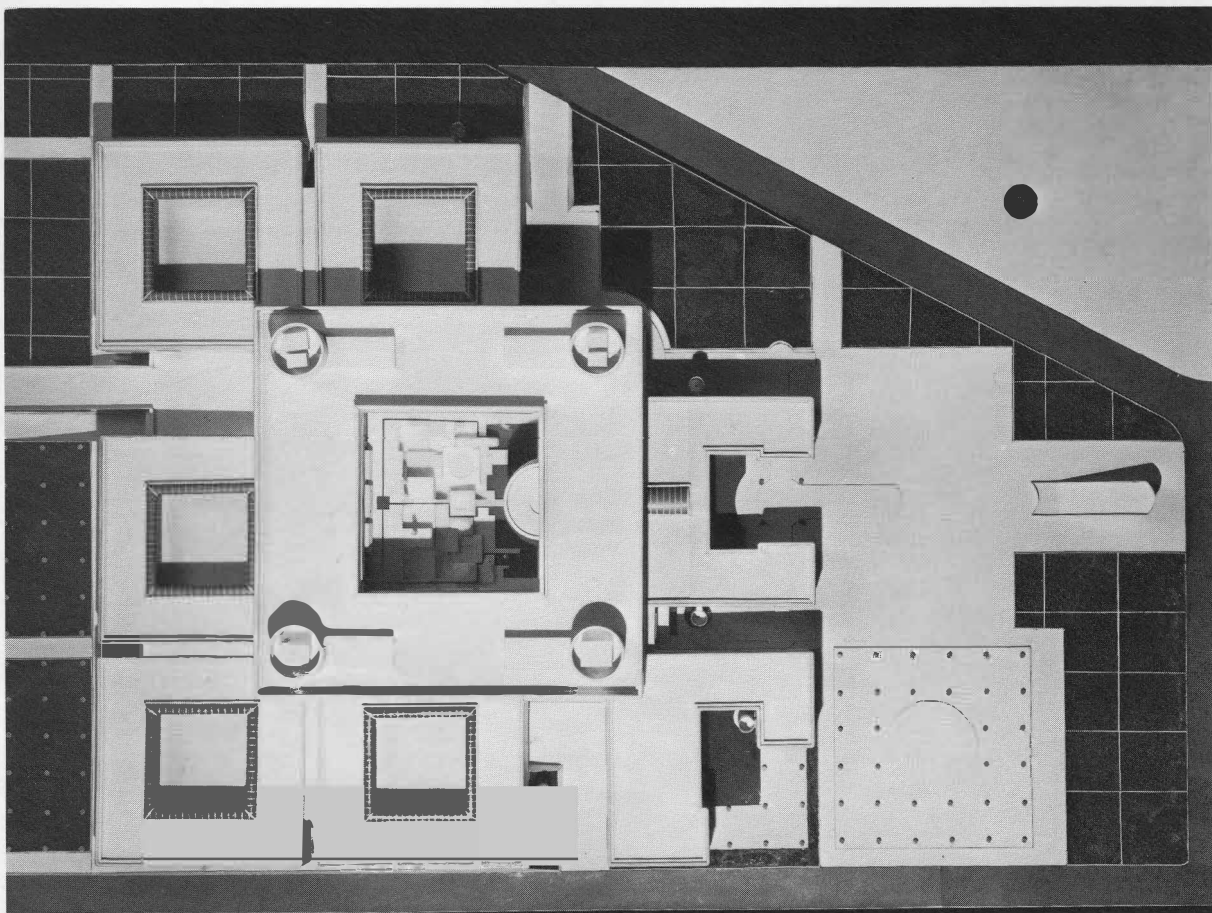


Façade

Plan of the upper floor



Aerial view of model

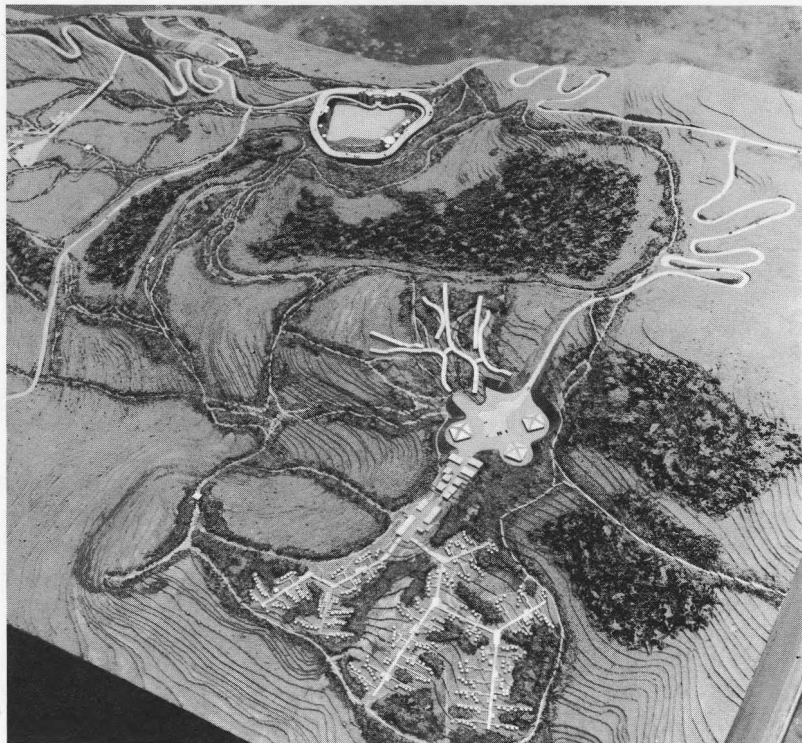


The Resort Town of Okutadeshina, 1965

198 This project is based on the principles of architecture of the street. The plan is in the form of a circuit to provide different viewing points, changes in scenery and entertainment. A pond inside stimulates nature.

Static architectural forms were used to encourage relaxation, enhanced by trees. In the spring, when the new plants and leaves start to grow, mobile homes and trailers come to Okutadeshina from the cities.

(This plan was not built but provided the basis for the Yamagata Resort Centre in 1967.)



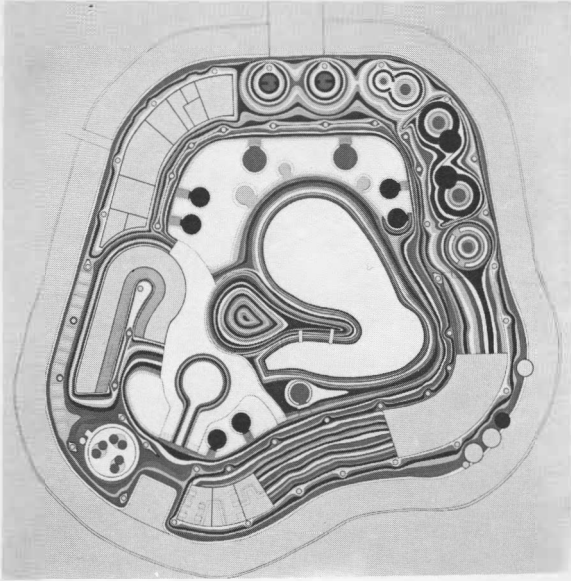
Aerial view of model



Aerial view of model, detail

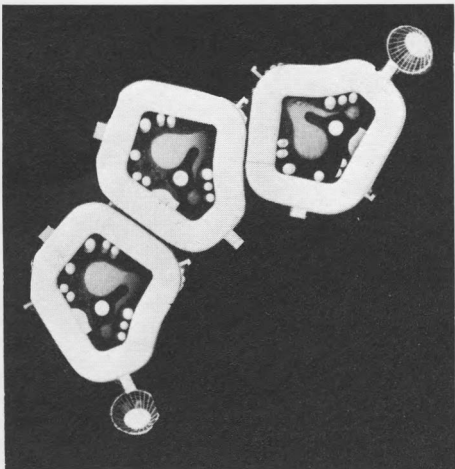
Yamagata Resort Centre, 1967

The origins of Japanese leisure activities lie in pilgrimages and excursion trips. Travel and recreation are related to religion, pleasure and romance. This plan involves architecture for travellers. People move around inside the centre, which is filled with entertainment facilities. The outside is brought inside the building through indoor gardens which imitate nature.



Plan of ground level. The floor is painted multi-colour

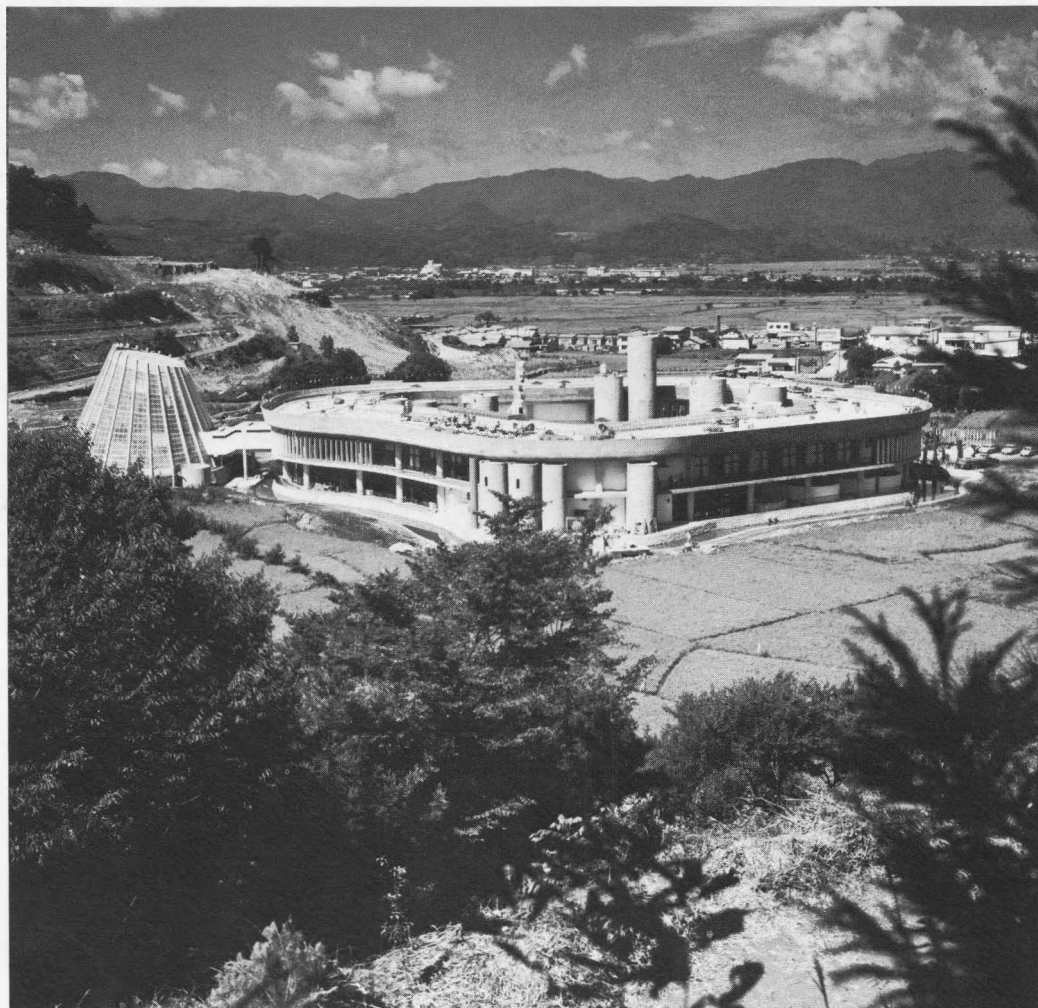
Projected extension



Swimming pool and artificial hill enclosed by the building

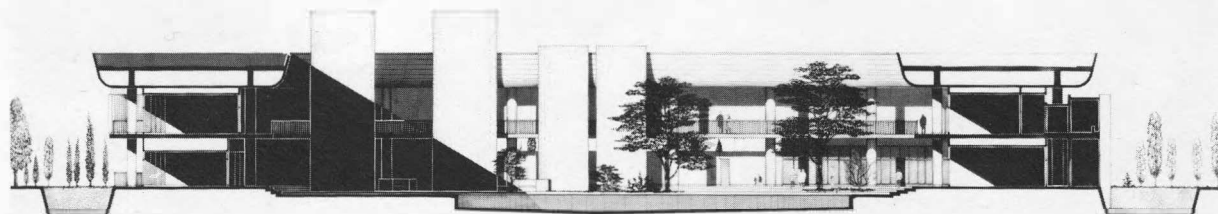
Aerial view of site under construction





View from near-by hill

Section

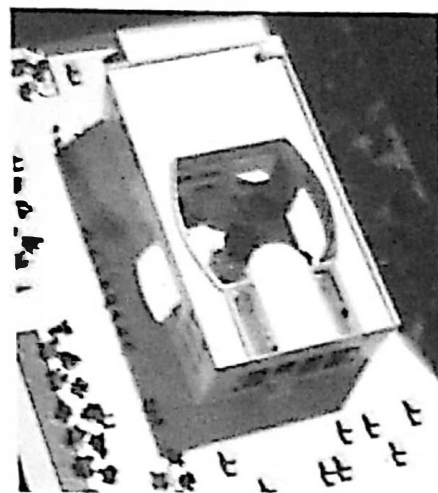
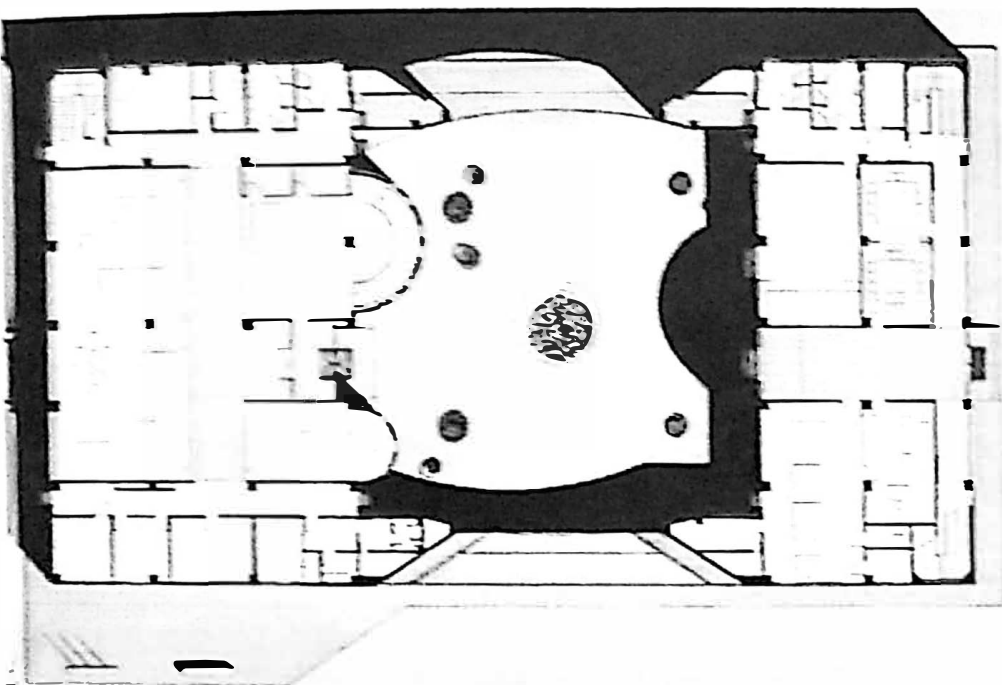


Waki-Cho City Hall, 1975

An *en-space* is arranged between the office building (administration) and the assembly hall (legislation). This space does not contain a garden but serves as a passageway

between the two buildings. Open on top and half-open to the sides it is an 'in-between' space, between the exterior and interior.

Plan of ground level



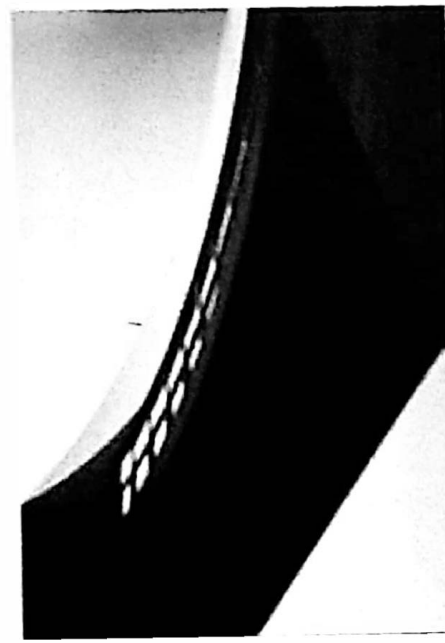
Aerial view of model

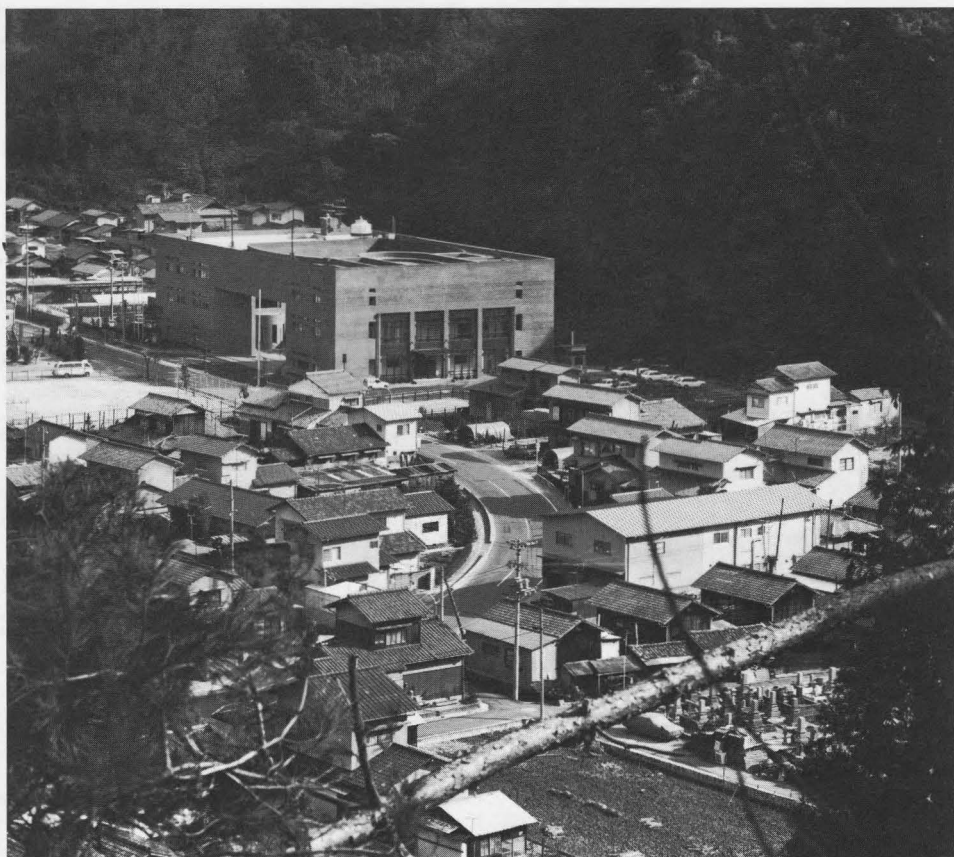


Interior of assembly hall

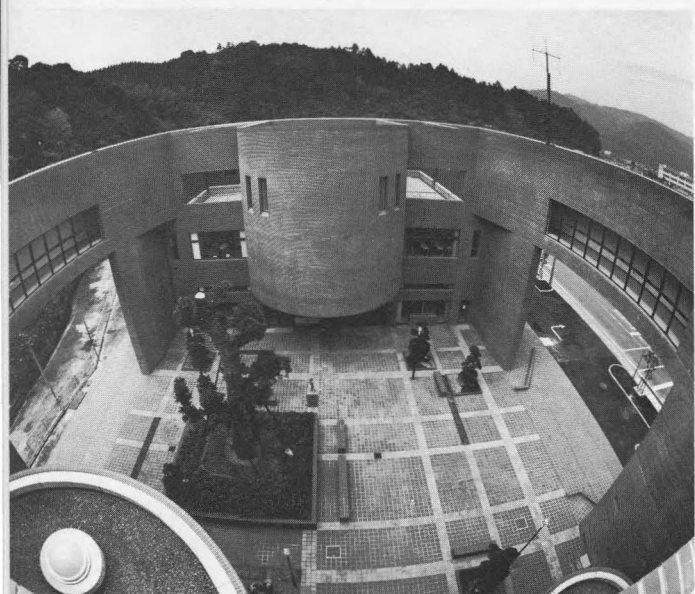
Detail of bridge connecting offices to assembly hall

View from below of the en-space





View from near-by hill

Fish-eye view of *en-space*

Gate

Sports Centre, Vasto, Italy, 1975

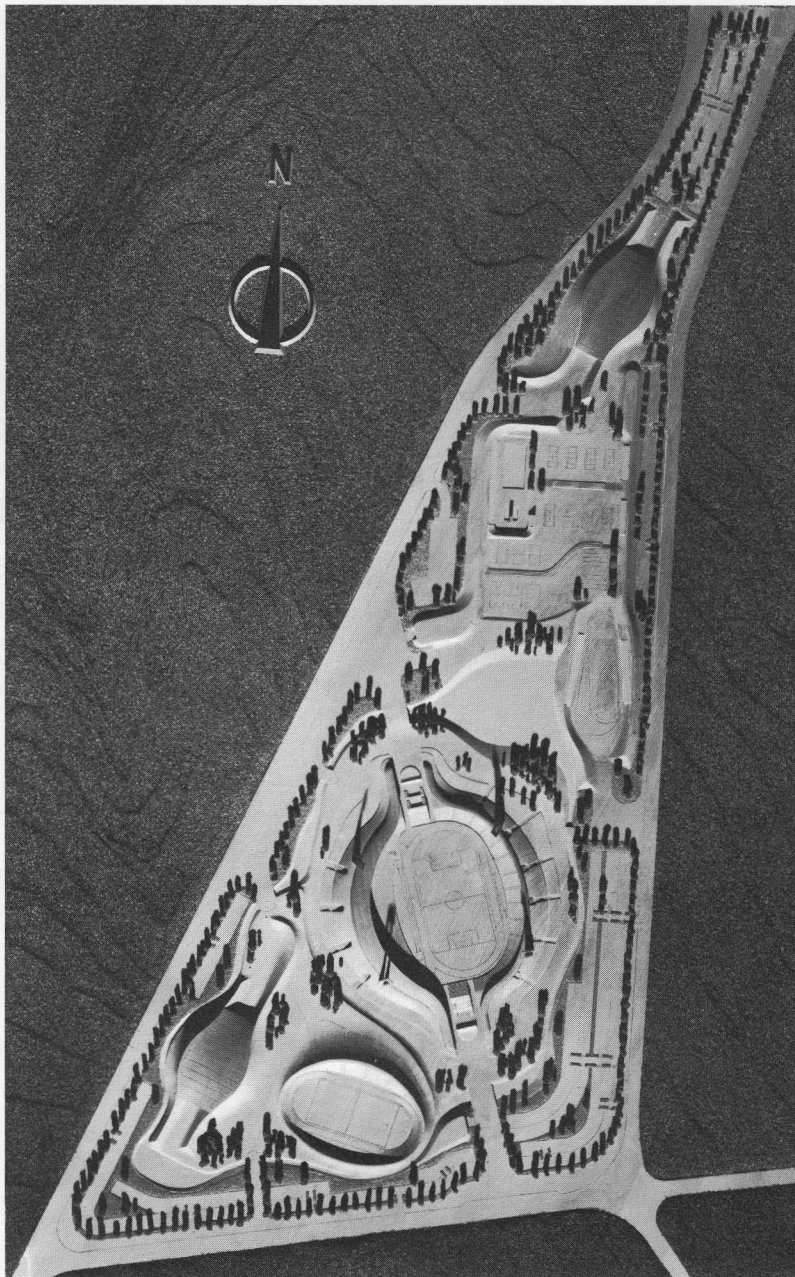
This project involves the construction of a soccer field as the first stage of a sports centre in the city of Vasto, Italy. An artificially elevated park is being constructed on level ground so that one part is almost completely buried. The roof over the seats around the soccer field will be covered with Italian pink marble. The playing area will not be completely shut off from the exterior but

will be half open. In this way both the excitement of the match will be spread outside and the natural surroundings will be visible from inside.

Model

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Model plan of sports complex

Preliminary sketch



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